

Atari Classics

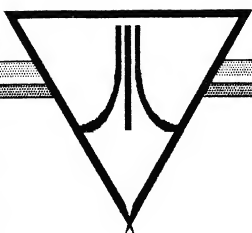
May/June - July/August
September/October 1995

Volume 4, Number 3

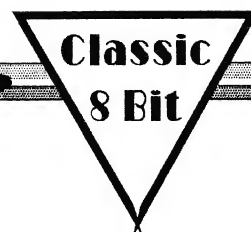
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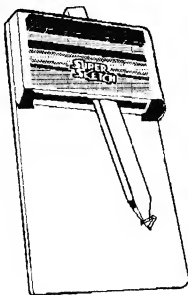
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Atari Classics

Volume 4, Number 3
May/June July/August
September/October 1995

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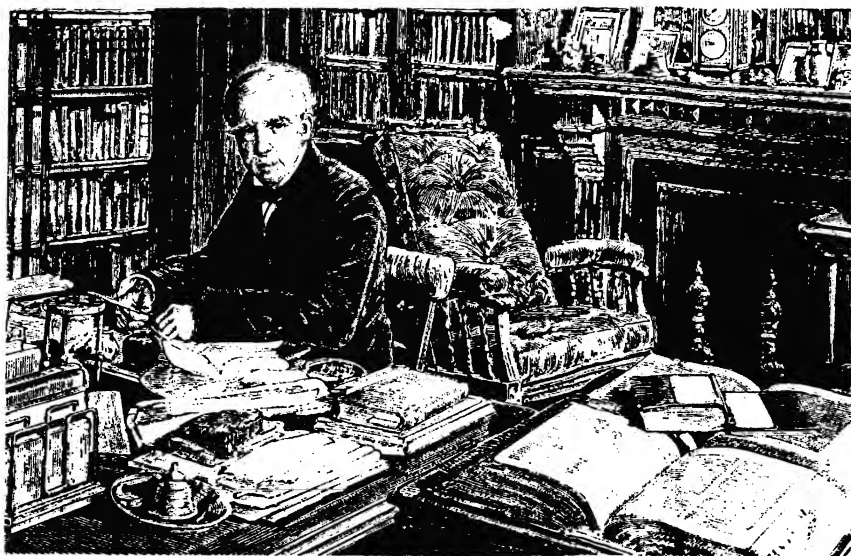
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Mr. Woolley's Words of Wisdom & Disk Details

Well, here we are again—another issue of Atari Classics is sent to bed. The Atari 8-bit world is invited to comment on its content and our layout, but be advised that positive observations will make a better impression on our poor, over-worked psyches.... What I mean to say there is that we probably are harsher critics of our work than the general readership, but we do need our customers' perspectives. One of the reasons that our publishing schedule is less than consistent is our desire to produce as good an issue as possible—leading to a reluctance to print anything that seems less than optimum quality. A great deal of the quality in the magazine is generated in the articles that you, the Atari 8-bit users, submit to AC. Those, and the advertisements that we manage to coerce from the remaining 8-bit businesses, make up the essence of AC. In a word, without the efforts of our authors, AC would stink. And, yes, this is a thinly veiled message to all you would-be contributors out there. Write an article for AC! Not to fill up the space. Not for fame and glory. Certainly not for fortune. Write an article because many of you folks out there come up with some really good stuff. Things that would never see the light of day, otherwise. Articles that other users enjoy and use in their little corner of the 8-bit world. I can understand how you get too close to anything you try—by the time you finish an article, you've read it so many times that it seems stale and useless. Believe me, it's better than you think. Try it. For the rest of us. OK?

This issue seem a little light? Yeah, it is only 36 pages..... (hmmm.... by issue 10, we'll be



down to a couple of ads and an editorial). Naaawwww. We still have about 20 pages of text and 4 less ad pages. Not that every issue will be 20 pages of text, but this is about what we would like to print every issue. This being a disk issue, we're trying to keep it under 5 ounces too.

Disk Details

Speaking of disk issues, what do we have on this disk? Well, we use the disks to distribute any code that is used in our last two magazines, as well as any auxiliary files from those articles. Unfortunately, our first attempt at producing a disk (two issues ago) was less than successful. It seems that some of our disks had defective sectors in the TVBINGO code, so we are including it again in this disk. Bob Scholar, a very careful guy, has volunteered to duplicate the bulk of our disks so we have high hopes for a much better result this time. The new stuff is as follows:

BINGO.BAS - TVBingo from the last disk, a repeat.
BESTBAS.LST - listed BASIC routine from Besting BASIC, V4, N2

PAGE12.TXT - Daisy-Dot III instructions for using the Chess font included herein
PAGE13.TXT - more DD III Chess font instructions
PLAIN.NLQ - used with DD III and Chess font
PLAIN2.NLQ - also used with DD III and Chess font
CHESS.NLQ - DD III Chess font itself

MVRAM.ASM - ED/ASM file used with SmartOS
MVROM.ASM - ED/ASM file used with SmartOS
SETCART.OBJ - ED/ASM file used with SmartOS
CHKSUM.OBJ and CKSUMD6.OBJ - M/L files to correct OS checksum for SmartOS

and...our usual really cool menu program from Nir Dary!

and...on the backside...a demo of the Brundles program. Three different samples, actually. Like many of the European games, this works better on a Nir-PAL machine, but you'll get the idea on a standard NTSC unit. Enjoy!



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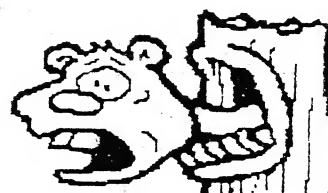
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I would like to inform your readers that I have a disk catalog available listing over 60 original game titles currently available for Atari 8-bit computers. Copies of the catalog are available for \$2.00 cash or money order ONLY. The catalog includes sample programs.

James Catalano

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Help!

Is there anyone out there that can help me put the Atariwriter dictionary on a double density MyDos

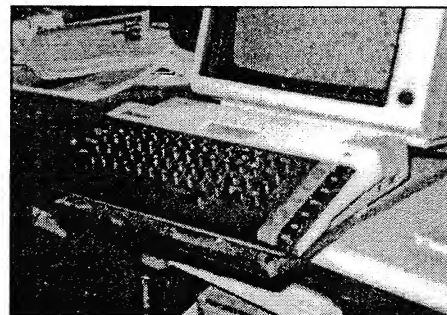
disk, so I can have room to add the AW+ program, etc.? This is so I can sector copy the whole thing into the US+ ramdisk.

Brad Rand

255 Falmouth Rd.
Falmouth, MD 04105-2005
(207)781-4877

P.S. Here's a photo of my 130XE with a 600XL key assembly. This is a solution to the cheesy XE type.

With a little sawing and drilling the 600XL top fits like a glove. The fun part comes hooking up a ribbon connector. I also converted the CAPS key to another CONTROL key so I can move the cursor with one hand, and added a mini push button switch for caps.



Let's Follow Up!

Yes, Bob Woolley's hypothetical 65816 project is quite interesting. But whatever happened to articles on his 3.5" drive upgrade (mentioned way back in Antic!) or on his 1200XL's IDE drive add-on (mentioned in AC April '94). I would really like to see articles on those "up-and-running" projects first. I really want to know how to drop a 3.5" drive in my XF551 and I really want to know how to run an IDE drive on my computer. So how about putting the theoretical stuff aside temporarily and cover the working stuff first?

It worries me that some AC authors can so casually mention obtaining software and such from a BBS, CompuServe, GENie, Internet or whatever. That's alright for those of you who have a modem, a phone, lots of money to burn and live in the United States. Some of us are not that lucky. (I've seen figures that suggest services like CompuServe and Internet cost Australians ten times that of our American friends!)

Is there an alternative out there to the Bellcom PD library which closed some time ago?

Where is the "Transkey" obtainable from? I wrote Dataque quite some time ago but got no response. Are they gone?

What back issues of AC are available and what's the cost?

John Stecyk

After reading your letter, I came to the realization that you are correct. Although most of these projects that you mention have been published in the SLCC Journal, they are not in general distribution. And, they could use a little cleaning up.

Let's start with the IDE drive.... The SmartOS in this issue is the prerequisite to an IDE interface (as well as other uses). So, we'll pretty up the IDE interface and print it shortly. A 1 meg /

4 meg SIMM upgrade will be going to press. A floppy interface may be updated and re-printed as well as the 3.5 XF551. Anything else?

As far as the BellCOM disks, AC would like nothing better than to see someone continue the PD library. In fact, AC will provide a complete set of the BellCOM disks to someone who commits to keeping them current. How's that? We'll even put them on HD for our volunteer. To get this rolling, why don't all of you readers out there send us anything you find in the PD area that looks new. AC will see that it at least gets collected in one place. We would expect a lot of duplicates, so we'll print a listing of what we get to keep it reasonable.

All AC back issues are available except for Vol. 2/No. 1 for 1/5 the price of a one year subscription each. And if you *really* want Vol. 2/No. 1 we can provide a xerographic copy for the same price.

An Answer To Letters From M.R. and L.S.

I performed Bob Woolley's TTL modification on my XEP80, but have yet to try it out because I'm saving up for a TTL monitor. However, as I attempted the modification, I noticed what appear to be some inconsistencies between the photographs of the cable attachment points and the chart (on page 16 of the video issue). The chart lists wire one connected to pin 7 of U6 as well as wire two, but the photograph seems to have wire one connected to pin one of U5 and wire three connected to the bottom of C9. The other connections appear to be consistent, although the wires should be 4, 6, and 8 rather than 7, 8, and 9. I searched the Errata column in subsequent issues but found nothing concerning this, so I wondered if I'm right, or will I be in for a surprise whenever I connect my XEP80 to a TTL monitor?

I found this a very easy modification to perform. I purchased the DB-9 connector from Jameco, 1355 Shoreway Road, Belmont, CA 94002-4100. Although I used an IDC crimping tool to attach the connector to the 9-conductor flat ribbon cable, I thought that perhaps a pair of adjustable Vise Grip pliers might work, if long, flat strips of wood or plastic were inserted in the jaws of the pliers to protect the connector and distribute the pressure more evenly.

As for programs to create a disk library index, I searched my old issues of Antic and found three that L.S. may find useful. In the August, 1986 issue are Floppy Filer, which prints out disk directories, by Robert Blaney, and File Master, a database which sorts files alphabetically, by Jason Worley. In the November, 1987 issue is Bibliography Master by Alfred Filskov III, which alphabetizes listings and could be used for disk indexing. Also, Twenty-Fifth Century Software, maker of Forms Generator, had a program called Instant Alphabetizer, which may still be available from B&C ComputerVISIONS.

John D'Ambrosio, Jr.

When you refer to the wiring of the ribbon cable on an XEP80, take into account that we are referring to the pin numbers on the DB-9 connector, not the ribbon cable wire number. A crimped IDC DB-9 connector with the red stripe on pin 1 of the DB-9 will connect across the ribbon as pins 1,6,2,7,3,8,4,9,5. Therefore, the ribbon cable wiring will be:

wire 1	U6 pin 7
wire 3	U6 pin 7
wire 4	left end of R3
wire 6	U6 pin 9
wire 8	U6 pin 10

which correspond to the original wiring using the DB-9 pinouts. U6, pin

7 is ground, so you may use any ground point on the PCB in the XEP80 (which is shown in the photograph). OK?

Thanks Alchemist

Just wanted to thank my old friend The Alchemist and Atari Classics for the most extensive article on any floppy drive but most assuredly on the PERCOM. With a certainty, it will be helpful to a friend of mine who is having a Percom modified for use with his 130XE. Sadly, I have been ineffective in creating within this friend, a desire to have a subscription to Atari Classics. Maybe this will put him "over the edge" to become a subscriber.

Thanks loads, you will be seeing my renewal soon.

Gary C. Matteson

Snail-Mail, A Misnomer

As a prolific letter writer (about \$1,000 a year—stamps and postal cards) I feel debased by derogatory discription of my missives as SNAIL-MAIL. To me it sounds snobbish.

Letter-MAIL may not be fast as modem E-MAIL but I can communicate more for my L-Mail dollars than E-Mail. Check my phone bills.

Letters are edited and abridged to least amount of words before mailing so they represent me and what I want to communicate (within most number of words allowed) for first class stamp or postal card.

E-MAIL requires frequent check of BBS mail box for response. If there is none I still pay (on limited call service and tolls) for modem phone calls. Maybe E-MAIL is Expensive-MAIL and misnamed Electronic-MAIL.

Joseph E. Hicswa

Awww, thanks, James

Congratulations on your outstanding success of the (New) AC. I received my first three issues a few days ago and I am 200 percent satisfied. Dare I say that the magazine is now better than before. (No offense Ben.) The quality and content is much improved. In fact I enjoyed reading them so much that it has rekindled my interest in my classic. Something that happens every 6 months or so. I am now looking to purchase more software and hardware upgrades. I am interested in the Black Box and Floppy Board by CSS. Maybe you could do a comprehensive review of its capabilities and uses. Possibly include testimonials of real life experiences with BB/FB. It may sway me into a purchase along with other fence sitters. Again keep up the great work and understand that it is appreciated by us out there who still love our classics.

James Martin

Getting Up To Speed

First may I express my thanks for your efforts on a fine magazine. When I rediscovered my Atari in the closet (after nine years of dust collecting), I was surprised that any Atari 8-bit users were left, and a magazine to boot! Now I have lots of questions. A lot has developed in those years of neglect. I will try to be as brief as possible.

① I subscribed to your magazine late, asking for the first issue. I received it (Vol. 3, No.3) and the second issue (Vol. 4, No. 1) so far, but I feel like I'm reading yesterdays newspaper. Can I receive all issues and disks to date and then receive the latest issue like everyone else?

② Today's modems are fast. Probably too fast for my 8-bit. What is the baud limit, and what is the fastest software available? Can 8-bits

transmit FAXes?

③ Which companies still have good databases of 8-bit software? Compuserve? Delphi?

④ I bought a couple of used Atari XF551 drives. I hear they are double sided, double density. What DOS will allow me to use this capability? Is it possible with DOS 2.5?

⑤ What is the best or most popular DOS program?

⑥ What is the best way to back up my disk and cartridge software? How long should the originals continue to function?

⑦ Volume 3, Number 3 had a letter from Decker G. McAllister, Jr. about ATESIG and model trains. No address was given to write to him for information. Do you still have his address?

Thanks again for your continued 8-bit support.

Mark Lyle

① You will notice that the current issue is now dated correctly. You should have Vol 4, No. 2 as well as this issue to complete your collection.

② I use BobTerm at 9600 baud on an 850 and Hayes Accura 14.4. Seems to work just fine. No Fax capability on the 8-bit yet.

③ The InterNet seems to have just about everything - just hard to find. CompuServe, Genie and Delphi all contain good selections of 8-bit software, but it is shrinking.

④ MyDOS and SpartaDOS will use the whole 360K on an XF551. DOS 2.5 is 127K, max.

⑤ MyDOS is my choice, but a lot of folks like SpartaDOS.

⑥ Sector copy your disks and hope you don't need them. Cartridges are a little tougher. Careful use of disks will keep them going for 20 years. Most failures are bad hardware, physical damage or procedural errors.

⑦ Decker G. McAllister, Jr.
145 Surf Place
Seal Beach, CA 90740

Solution of the Month

I just love those old time adventures.... Can't solve them for dirt, though! For all you folks out there who want to introduce your kids (grandkids, younger siblings, etc.) to Atari adventuring, check out our solution of the month. This is to HELP the little darlings, not to ruin it for them, so don't just let them read the answers.

Provided by Nir Dary

ADVENTURELAND

Here you stand in a forest, about to start your adventure. Move along East, and tiptoe past the sleeping dragon. Go East again to the lake. Get the ax (leave the fish for now, since you have no way of getting them yet), then head North into the quicksand bog. Pick up the blue ox (*wow!* A treasure already!), then say the magic word on the ax. Gee, where did everything go? Well, look at it this way: at least you can "Swim" back to the lake. Now go South to the bottomless hole. Carefully "Go Hole," and pick up the flint and steel. Go up (easy, it's a long way down!). Then it's West into the swamp, and West again to the hidden grove. Surprise! There's the ax and the ox, along with another treasure.

Get everything, and go back East. Climb the tree, get the keys, and climb down again. Now, "Chop Tree." Drop the ax (you won't need it again), get the mud, then, "Go Stump." Once inside the stump, drop the mud, ox and fruit. Go down to the root chamber, pick up the rubies, then go up and drop them off. Easy, isn't it?

Okay, time for more treasures. Get the lamp and rub it twice. Each time you rub the lamp, a genie appears and leaves a treasure. Just make sure you don't rub it more than two times, or the genie will come out and *take away* a treasure! (can't win the game that way!) Now, go down into the root chamber, and "Go Hole." Open the door and drop the keys. Light the lamp (it's dark up ahead), and "Go Hall." Then continue down to the cavern. From the cavern, trek South and pick up the bladder. Now it's time for a return trip, so move along North, then up until you're out of the stump and back in the swamp again (by the way, any time the chiggers chomp on you, just get the mud, then drop it again. Also, "Unlight Lamp" when you get back to the root chamber...energy conservation helps!). "Get Gas," then "Go Stump." Now head back down to the cavern (remember to light the lamp before going into the hallway!), then go South and up. Drop the bladder and "Ignite Gas." *BOOOOM!* You just blew a hole in the bricked-up window.

"Go Hole," then jump (don't worry, you can make it to the other side safely). Ummmm, hello, bear! Well, he doesn't look too mean, but it's better not to take any chances, so "Yell." As the startled bear falls down towards the bottom of the chasm, pick up the magic mirror

(carefully, it's *very* fragile!), then "Go Throne." Grab the crown and go West to the ledge. Jump over again, then West. Pick up the fire bricks on your way out (heavy stuff, but you'll be needing them soon), and go down and North. After that, make your way up again to the treasure room in the stump. Drop off *only* the crown. *do not* drop the mirror!

Okay, now get the bottle of water, and go down again. This time, drop the flint just before you go into the hallway. Go down to the cavern, and from there, down again into the maze of pits. From the "Opposite of Light" sign, go down, West, and down. Pick up the rug, then go down again and you're at the bottom of the chasm. "Build Dam," then drop the remaining bricks (you had a few left over). "Look Lava," and there's a firestone. It's still pretty hot, so "Pour Water." Now get the stone and the golden net. Hmmmm, but how to get out of here? Well, that sign might help. "Say Away" twice and, voila! you're in the meadow again (ahhh! fresh air!).

Unlight the lamp, then go South (to the swamp) and over to the stump. Drop the firestone, the rug, and the mirror. Make sure that you drop the rug *before* you drop the mirror! (otherwise, seven years of bad luck and you won't be able to finish the game!) Now, get out of the stump, go East to the hole, and North to the lake. "Get Water," then "Get Fish" (can't get them without the net, you see). Return to the stump, and drop off the fish and the net, in that order.

Pick up the mud, and head back down to the cavern. Remember to get the flint and light the lamp before entering the hallway! Once in the cavern, go North. At this point, you should save the game. Up ahead are the African bees, which you will need to get rid of the dragon. Unfortunately, this part of the game seems to be random, and sometimes the bees will suffocate and die before you can bring them out. I have never found a surefire method for keeping the bees alive, so save the game here and hope you won't have to restore it too many times! (If anyone does find a way to keep the bees alive, please let me know!)

Okay, now that the game is saved, go North again. Get the honey, pour out the water, and get the bees. (If the bees sting you, and you find yourself in limbo, either restore your saved game or "Go Up" to return to life in the outdoors.) Once you have the bees, head back South to the cavern, then all the way back up to the swamp. If the mud hasn't fallen off yet, drop it here before going on (the dragon *hates* the smell of mud, and will most certainly kill you if you go near her with it -- yes, *her!*). All right, now head North and "Drop Bees." The dragon will become annoyed and fly away, leaving behind some precious and rare eggs. Pick up the eggs, then return to the stump. Drop the eggs and the honey, then say "Score."

You did it!! (Whew! You deserve to take some time out now and relax! But wait...could that be a pirate flag I see on the horizon...?)

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The Garret Chessnuts

Ed Hall

When I was little, my grandfather taught me how to play chess. He gave me a little book of basic openings, which I tried to learn, though I found the strategy less interesting than the names (like Ruy Lopez and Giuoco Piano). Later, when I was in university, I became friends with the provincial champion, and for a while joined the local chess club. It was a humbling experience, playing teenagers nearly half my age and getting my butt kicked. I was introduced to speed chess, or blitz, where you're allowed only a few seconds per move. The kids loved it. It was just like playing hack-and-slash at the local arcade.

Occasionally my friend played simultaneous matches against as many as 20 people. Blindfolded. He was rather blasé about this feat; it was far short of the record for such matches, and he regarded it as little more than a parlour trick. The secret, he told me, was to apply an arresting label (like "elephant") to each match. Then, as he moved blindfolded from board to board, all he had to do was recall the label, and the correct game would be accessed.

I never was any good at the game, but chess lore such as this fascinated me. I began reading about some of the great figures: Paul Morphy, a boyish American who conquered the best in the world, then returned home and went mad; Jose Capablanca, the handsome Cuban idol, a "chess machine" who was never checkmated; Mikhail Tal, known as the "firebrand" for his

bold sacrifices and breakneck combinations; Aron Nimzowitsch, father of hypermodern chess, who was once challenged to a duel for his insulting behaviour at a tournament....

No, the stereotyped picture of chess players as dull old geezers covered with cobwebs is all wrong. I remember my friend once remarking that an acquaintance of his did not have "the right nerve" for chess. The game can be a battlefield, a savage arena where opponents are bludgeoned into submission, or dispatched with subtle, rapier-like thrusts. And chess is not just mentally taxing, it's physically exhausting. The coiled tension and the long hours at the board can take a staggering toll, and are the cause of outbursts which seem fantastic to the average person. As former U.S. champion Larry Evans once said, "The chess master today must have courage, a killer instinct, stamina and arrogance."

CHESS PROGRAMS

For centuries, people have been fascinated by chess automata, even though most of these devices were frauds, usually with a person hidden inside. Today we really do have thinking machines, and a computer without a chess program is a forlorn thing. Here are a few notes on software available for your classic Atari:

Computer Chess – The earliest of all chess programs for the 8-bit Atari, this 1979 cartridge-based game from Atari Corp. sports bilious colours, abysmal graphics, and al-

most no features. Joystick-operated.

Chess 7.0 – By Larry Atkin (Odesta 1982). The best of the early games with many features and serviceable graphics. Cursor movement is rather awkward, accomplished by paddles or cursor keys. Translator required.

Micro Chess – A simple version with odd graphics and few features. Movement by algebraic notation. Translator required: specifically, the Atari OS translator by Jonathan Sanders.

Sargon – Written by Dan and Kathe Spracklin, this program is one of the oldest, has gone through several incarnations, and was available on many different computers. The original Sargon was written in Z-80 code and analyzed in the book, *Sargon, A Computer Chess Program*. The publisher, Hayden, also released the subsequent software versions. **Sargon 2** (1982) employs algebraic notation (though coordinates are not displayed) and remarkably ugly graphics. **Sargon 3** (1985) is a much improved version, and for a time was considered the front-runner in the chess wars. The Atari version was done by Lynn and Alex Ford. Decent graphics, and movement is accomplished by joystick or algebraic notation.

Chess – This cartridge-based game from Parker Brothers offers bright, pleasant graphics, and just enough features to satisfy those players without a deep interest in chess. It is often found in PD libraries and, though it lacks any distinguishing text, it can be iden-

tified by its length (66 single density sectors). An interesting aside: this is the only Atari 8-bit game which shows pieces actually moving from one position to another. In all other games a piece is "moved" by disappearing from its old position and reappearing at its new position. Joystick only.

Chess – Rather surprisingly, this program by John Krause is the only BASIC chess program for Atari 8-bits. It appeared as a type-in listing in the December 1984 issue of *COMPUTE!* Does not check for illegal moves. Nice graphics. Joystick only.

Master Chess – A budget offering from Mastertronic. Decent graphics but few features. Algebraic notation.

Mychess II – By David Kittinger, Atari version by Walter Hochbreuckner (1984). This under-rated version from Datamost has lots of features and a good manual. It also made the first serious attempt to make graphics an important feature; unfortunately the colour scheme nullified its efforts in this area. Mychess II was also the first game with 3D graphics, and although the game is virtually unplayable in this mode, it's still a neat hack. Algebraic notation.

Chessmaster 2000 – This is the Cadillac of Atari chess programs. It has tons of features, a good manual, and gorgeous graphics. Though no credit is given for the game's development, its similarities to Mychess II are too great to be a coincidence. Movement by joystick or algebraic notation. The Software Toolworks (1986).

Colossus – A superb program by Martin Bryant, with many features and (surprisingly) the only one with a clock. The monochrome graphics are crisp and pleasing. Movement is by cursor keys or algebraic notation. There were two releases, but only

Colossus 3.0 (1983, 1984) was marketed in North America, by ANTIC. It was followed by **Colossus 4.0** (1987) and an ST version, **Colossus X**. In issue 37 of *Page 6* magazine, John Davison pitted **Colossus 4.0** against **Colossus X**. In 12 matches, both programs had identical records of 5 wins, 5 losses, and 1 tie. The docs for **Colossus 4.0** report the results of 16-game matches against the following programs:

W	L	vs
16	0	Master Chess
16	0	Atari Chess
16	0	Parker Chess
16	0	Odesta Chess
13	3	Sargon 3
11	5	Mychess II

SuperQuerq Chess – The newest chess program for the Atari 8-bit appeared as a disk bonus in *New Atari User* issue 64 (October/November 1993). Written by John White, this program does not have as many bells and whistles as **Chessmaster 2000**, but it has all the essentials and plays a strong game. It is also "unusual among chess programs in that it relies more on the strength of its positional play than on its tactical play." Simple but pleasing graphics. Algebraic notation.

Chess by Modem – My grandfather used to play postal chess. If he were alive today, we could play by modem using one of the following programs: **Telechess** by Thomas McNamee and Peter Goodeve, *ANTIC* May 1983; **Modem Chess** by Gary Heitz, *ANALOG* 48; and **Telechess** by Alan Weston, Hawaii Users Group Atari. The first two programs are written in BASIC, the last one in *ACTION*.

FAIRY CHESS

Such is our endless fascination with this game that many variations exist. Known as fairy (also crazy, heterodox, or unorthodox) chess, it covers the inclusion of new pieces (e.g. the amazon, the giraffe, the zebra, the nightrider), altering the board (e.g. cylinder chess), or changing the rules (e.g. circle chess, three-handed chess, three-dimensional chess).

A simple example of rule-changing is **Killer Chess**, written in *ACTION* by Greg Knauss (*ANTIC*, February 1988); it is identical to speed chess, except that players don't take turns.

A little more exotic is John White's **NegaQuerq II** (part of the same disk bonus as **SuperQuerq Chess**). It's a suicide game where the object is to lose all your pieces as quickly as possible.

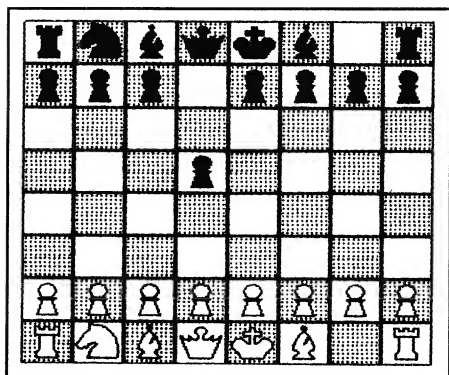
Two well-known commercial games, **Archon** and **Archon II**, are too divergent (new boards, new pieces, new rules) to qualify as fairy chess.

PUZZLES & PROBLEMS

Chess problems have a long and honourable association with the game. Players are presented with a board and several pieces, and given an objective, usually to find mate in a certain number of moves. Preparing and/or solving such problems can be educational, entertaining, and addicting.

Problems are usually presented on paper (in books, newspapers or magazines), and thanks to David Richardson, we can take part in the fun. You'll need *Daisy-Dot III* and David's disk-based user manual, which includes a special chess font. Pages 12 and 13 give complete instructions. An example of the output is shown on the next page. The problem is by Mortimer: from the start of a normal game, obtain the

following position in four moves. (Note: a single move consists of one each by white and black.)



If you don't have Daisy-Dot III, don't despair; most chess software will allow the user to set up and work on a problem. There are also some programs which are dedicated to a single problem:

Knight's Quest – In this ancient problem (known as the knight's tour), you must move a knight so that it lands once on each of the 64 squares. There are many possible solutions. If you're really good, your 64th move will bring you exactly one move away from your starting position. Uses joystick or ST mouse. Nicely programmed by Simon Trew.

Horse Play – A BASIC version of the knight's tour by Malcolm Iredale. Published in *Atari User*, March 1986 (an old British mag not to be confused with Page 6's New Atari User).

Five Queens Problem – Place five queens on a chessboard so that all squares are under attack. A compiled Turbo-BASIC program by Kemal Ezcan, *ZONG* (October 1989).

Eight Queens Solution – Can you position eight queens on a board so that none are under attack? This BASIC program finds (slowly) all 92 possibilities. By Angelo Giambra, *ANTIC* (April 1985).

Eight Queens Solution – An ACTION program which solves the problem with blazing speed. It also

finds the 12 unique solutions in 30 seconds (only 12 solutions are not duplicated by rotating the chessboard) and all 92 solutions in about 40 seconds. By Dave Oblad, *ANTIC* (September 1985).

If you're interested in programming a chess problem yourself, you might refer to a BASIC program by John White in the April 1986 issue of *Atari User*. It draws a chess board and pieces.

FOR MORE INFO

If you'd like to learn a bit more about chess, here's a brief and quirky list:

The Adventure of Chess by Edward Lasker (Dover Publications, 1959) – A very readable introduction to the history and personalities of chess, with many personal anecdotes, some stretching as far back as Morphy.

Writing Strategy Games on Your Atari Computer by John White (Sunshine Books, 1983) – The programmer of SuperQuerg and NegaQuerg discusses various chess programming techniques and includes some short BASIC programs. (This book is still available from Page 6 in England for a paltry 1.5 pounds.)

The Squares of the City by John Brunner – A science fiction novel based on an 1892 chess match between Steinitz and Chigorin.

Searching for Bobby Fischer – A recent movie available on videotape, based on the true story of a young chess prodigy. There are no car chases, no gunfights, no sex scenes or foul language. Yet the movie is so well-done and so exciting that my seven-year-old daughter hauled out the chess board and wanted me to teach her how to play before the movie had even finished. Highly recommended.

Finally, for casual browsing, I'd suggest a dictionary or encyclopedia

of chess. I guarantee you'll find something amazing every time you pick it up. For example, **The Penguin Encyclopedia of Chess** (edited by Harry Golombek) has an entry for "shortest game". At an interzonal tournament in 1970, Bobby Fischer opened with P-QB4 and his opponent, Oscar Panno, promptly resigned! Of course, there's a story behind it...

FINAL THOUGHTS

In August of 1994, reigning world champion Garry Kasparov played two games against Genius 2, a computer program designed by Richard Lang, an English physicist. Kasparov lost the first game, drew the second, then "stormed off in a huff" according to *Discover* magazine (January 1995).

Despite his disgrace (and if I had a PC), I'd buy Kasparov's Gambit, a jam-packed program which features video clips of Kasparov, and verbal coaching tips delivered by the grandmaster himself. The other non-Atari program I'd buy is *National Lampoon's Chess Maniac 5 Billion and 1*. You can guess what it's like.

By the way, if anyone knows of an Atari chess program I've omitted here, please let me know c/o Atari Classics. The answer to the chess problem will be given in the next issue.

I'll leave you with this comment about a Soviet grandmaster: "Bronstein was constantly tormented by an almost painful longing to create something new, to reveal something hitherto unknown.... His fantasy was a torrent which could not be damned." (S. Gligoric)

TUBE BADDIES

a game by Ivan Mackintosh and Richard Munns

distributed by Richard Gore

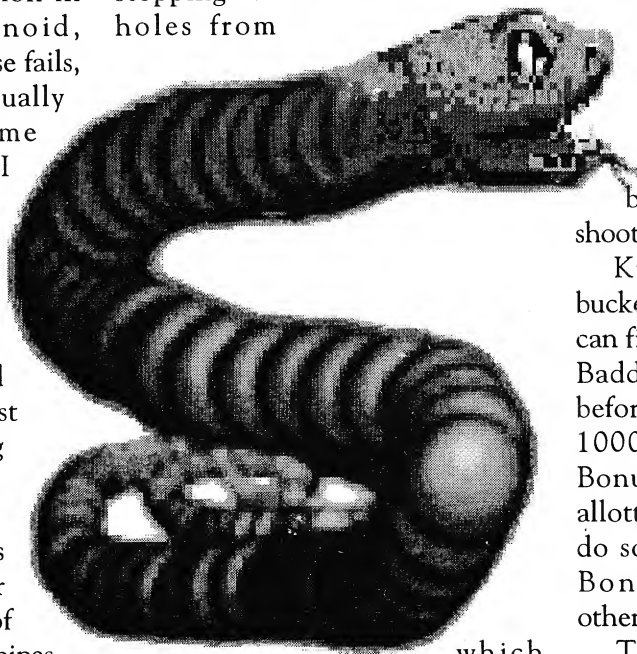
reviewed by James Hague

I've gotten good at predicting what games will be like simply from their names. Anything with "snake" or "worm" in the title is a clone of those old "eat things and grow longer" games, a la Snake Byte. Odd and complex science fictiony names, like Mirax Force, are usually scrolling shooters with a power-up that gives you a little rotating satellite buddy. Most easy to spot are games titled with permutations of the names of their famous predecessors. These are often suitable for publication in MAD Magazine: Aquanoid, Defenda, and Ultris. If all else fails, simple word association usually comes through. If a name contains the word "toad," I think "Frogger." It's this last rule that made me think Tube Baddies was going to be Tempest clone. I was wrong. And I was shocked.

Tube Baddies is a hard game to describe. It's the first game I've played in a long time that I can't brush off with "it's a clone of..." The main game screen is somewhat like an irregular Amidar grid, only instead of lines the maze-like walls are pipes. Along the bottom of the screen are ends of pipes, sticking up like the pipes you jump into in Super Mario Bros. At the center of this row is a bucket. With a face on it. You are, uh, a little droplet like thing. Wait....referring to the one-page documentation I see that you are a

handyman named Bip. Bip is not, confined to the pipework, he can roam freely about the screen. There's a two-player simultaneous play mode, which lets player two assume the role of Bop, who, not surprisingly, bears a strong resemblance to Bip.

At the beginning of a level, there are holes in the pipes. Out of these holes come the Tube Baddies—little creatures that are deadly to the touch. After they emerge, they roam the pipe network, periodically stopping to make new holes from



which new Baddies can jump out. You can patch these holes by pressing the joystick button when on top of one. Shooting a Baddie stuns it, causing it to move in the opposite direction of your shot. It will bounce endlessly back and forth, between the screen edges, until you shoot it again to

change its direction.

The goal is to stun Baddies and then use your shots to direct them into the pipes, or the bucket, at the bottom of the screen. This is simpler than it sounds. If a Baddie comes at you horizontally, shoot it. This starts it bouncing in a side to side pattern. Get above or below the stunned Baddie and shoot it vertically. This changes the direction of the bounce to up and down. When the Baddie hits the bottom of the screen in the course of this bounce, it will disappear into the pipes. This second shot seems to be necessary even if the first made the Baddie bounce up and down. It won't go off the bottom of the screen unless you shoot it again (vertically).

Knocking a Baddie into the bucket ups the Bucket Bonus. If you can finish a level, by eliminating all Baddies and patching all holes, before a timer runs down, you get 1000 points times the Bucket Bonus. Finishing a level in the allotted time is not easy. Failure to do so simply forfeits the Bucket Bonus, it doesn't hurt you otherwise.

The areas of the screen not covered by pipe, which are free from non-stunned Baddies, are not always safe. Bubble gum and spiderwebs slow you down. Solid walls block your path (later rounds restrict you in maze-like ways). One minor complaint about the walls is that in some levels they are arranged in a

way that makes more sense for the two-player game than solo play. And there is the requisite mish-mosh of powerups. One freezes you temporarily. One ends the round. One patches all holes in the pipe. One reverses your joystick controls for a few seconds. One makes you invincible. There are more, but to be honest, I can't figure out what they do.

I'm sure my description makes the play mechanic sound awkward. It is not, though. It's not as screamingly obvious as Pac-Man, but I picked it up within a few games. I like it that difficult, optional tasks are present, and you are justly rewarded for accomplishing them. Getting a high bucket bonus feels good, like it does to make a high-point squash or drop in Burger Time. And, boy, is it refreshing to play something that's different.

I think I see one of the big advantages of writing clones: that all of the gameplay details have already been worked out. Going out on a limb and writing something original leaves you open to make mistakes. The price of being creative, I guess. Tube Baddies has one such flaw and that is the lack of warning that a Baddie is about to come out of a hole. This is frustrating, because you are trying to get on top of holes to patch them. I've learned some ways to avoid getting nailed, like not making a mad dash for nearby holes at the start of a level, before the Baddies emerge, but I almost always end-up losing lives because of the sudden appearance of a Baddie a split-second before I lay down a patch.

This doesn't ruin the game, however. It is still different enough and fun enough that I want to keep playing. The two-player mode is a

hoot. And the programming is suitably slick so that the game doesn't look or sound at all dated. For me, Tube Baddies is something I hoped existed but never expected to find: an original game in the true classic Atari gaming sense. And yes, it is 1995.

Tube Baddies is available from:

Richard Gore
79 Sprotbrough Road
Sprotbrough, Doncaster
DN5 8BW
England

The price is 5 British pounds or 11 U.S. dollars. While International Money Orders are accepted, it is recommended that U.S. customers send cash. The U.S. price includes shipping; other overseas customers need to add 2 pounds.

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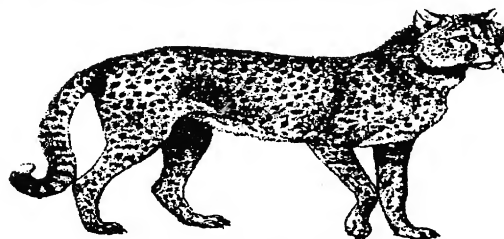
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PRG040	JOYSTICK INSERT (1)	1.50
PRG041	JOYSTICK HANDLES (2)	3.95
PRG055	PADDLE CABLE	1.50

EQUIPMENT COVERS

CUSTOM FIT:			
ACA072	130/65XE BLUE W/ATARI LOGO .	9.95	
GENERIC GREY NYLON:			
ACG150	UNIVERSAL COVER U2	7.95	
	FITS 800XL/810/1050/130XE/1027		
ACG151	UNIVERSAL COVER U4	12.95	
	FITS 12" MONITOR		
ACG152	UNIVERSAL COVER U7	8.95	
	FITS 800/1200XL/STAR PRINTER/ 825/XDM121/XMM801		
ACA059	130XE KEYBOARD SKIN	19.95	



PRINTER SUPPLIES

RIBBONS:			
SUG500	Atari 820 Purple	9.95	
SUG501	Atari 825 Black	6.00	
SUG002	Atari XMM801/SMM804 Black...	9.95	
SUG514	Atari XDM121 Black Mylar....	9.95	
SUG518	Atari XDM121 Black Fabric ..	7.95	
SUG504	Atari 1025 Spool Black.....	3.00	
SUG519	1025 OUTDATED RIBBON 12 Pack	5.00	
SUG510	NX-10/NP-10/NB-10 STAR Black	7.95	
SUG511	NX-1000/1001 STAR Black.....	7.95	
SUG512	NX-1000 RAINBOW STAR	10.95	
SUG069	NX-1020 STAR Black	9.95	

PENS:

SUG506	1020 PEN SET Black Atari ...	1.00
SUG516	1020 PENS 10 SETS Black	5.00
SUG507	1020 PEN SET COLOR Atari ...	3.00
SUG517	1020 PENS 10 SETS Color	10.00

PARTS:

PRA082	1020 PEN Holder Wheel	1.95
PRG054	801/804 LOCK Lever	5.00
PRA083	XDM121 WHEEL 10 Courier	15.00
PRA085	XDM121 WHEEL 12 Courier	17.50
ACA081	XDM121 Sheet Feeder	49.95

PAPER:

SUA004	820 PAPER (2 ROLLS)	3.90
SUA003	822 THERMAL PAPER (2 ROLLS) ..	3.95
SUA001	1020 PAPER (2 ROLLS)	3.95
SUG003	ADDRESS LABELS PIN FEED 1000	7.00
SUG037	ADDRESS LABELS PIN FEED 5000	19.95
SUG008	DISK MAILER ENVELOPE	1.00

DISKS AND SUPPLIES

DISKETTES:

SUG052	5-1/4" ATARI FORMATTED	10.00
SUG067	5-1/4" OPTIMA IN PLASTIC BOX	5.00*
SUG046	5-1/4" 810/1050 (not XF551)	3.00*
SUG062	5-1/4" 810/1050/XF551	4.00

NOTE: *NOT FOR XF551

BULK DISKS:

SUG016	5-1/4" BULK DISKS 10	2.95
SUG017	5-1/4" BULK DISKS 100	20.00
SUG018	5-1/4" BULK DISKS 1000	100.00

Bulk disks may contain old software and may be write protected. Use ACG059 or ACG060 to notch.

CLEANERS & MISC:

ACG059	SQUARE DISK NOTCHER	4.95
ACG060	DELUXE SQUARE DISK NOTCHER..	9.95
SUG048	3-1/2 & 5-1/4 HEAD CLEAN KIT	9.95
SUG022	5-1/4" WRITE PROT. TABS (100)	1.00
SUG058	5-1/4" COLR VINYL SLEEVES 12	1.50

HOLDERS:

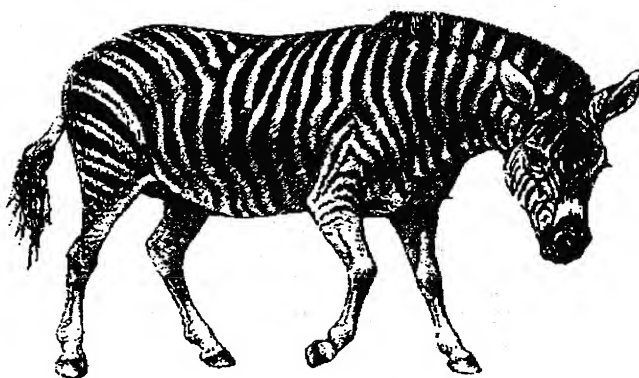
ACG042	5-1/4" DISKMINDER 75	4.95
ACG250	5-1/4" MEDIAMATE 50	8.95
SPECIAL	ATARI GREY CARTRIDGE FOLDER	4.95
ACG061	Cartridge FLIP & FILE	4.95
	(holds 8 cartridges and 10 5-1/4" disks)	
ACG073	MULTI MEDIA	7.95
	(CD's, 40 5-1/4" & 3-1/2" disks)	
ACG074	FLIP & FILE All Media	9.95
	(CD's, 140 5-1/4" & 3-1/2" disks)	

ATHW-2

800, XL, XE COMPUTERS AND ACCESSORIES

SERVICE MANUALS

SAMS COMPUTERFACTS:		
FSA001	400 Computer	9.95
FSA005	810 Disk drive	24.95
FSA007	1025 Printer	9.95
FSA006	1050 Disk drive	24.95
FSA003	800XL Computer	24.95
ATARI FIELD SERVICE MANUALS:		
FSA013	130XE Computer Tech notes ..	10.00
FSA014	400/800 Computer	25.00
FSA015	800XL Computer	20.00
FSA025	600XL Computer	20.00
FSA011	1050 Disk drive	20.00
FSA016	810 Disk drive	20.00
FSA024	XMM801 Printer	20.00
FSA017	820 Printer	5.00
FSA018	825 Printer	20.00*
FSA020	850 Interface	10.00
FSA008	1010 Recorder	5.00
FSA009	1020 Printer	5.00
FSA010	1025 Printer	20.00
FSA012	1200XL Computer	20.00*
FSA022	CX22 Trackball	10.00
FSA026	2600 VCS	20.00
SPECIAL	5200 GAME MACHINE	20.00
SPECIAL	7800, XEP-80 & XF-551 SCHEMATICS CALL	



COMPUTER/PARTS

PRA005	400 Printed Circuit Board PCB	10.00
PRA021	800XL PCB	75.00
PRA091	65XE PCB	75.00
PRA092	130XE PCB	125.00
PRA093	XE GM Main PCB	75.00
PRA022	1200XL PCB (64K).....	40.00
PRA035	800 MAIN PCB W/ALL CHIPS ...	10.00
PRA030	800 CPU,GTIA,6502 & ANTIC PCB	10.00
PRA057	800 10K ROM PCB.....	10.00
PRA055	800 POWER PCB.....	5.00
PRA019	800 PCB SET WITH MAIN,CPU, 10K OS, POWER AND RAM...	40.00
PRA020	800 PCB SET LESS RAM	30.00
PRA025	800 SPEAKER	2.00
PRA082	1020 PRINTER PEN HOLDER WHEEL	1.95
PRA004	RF MODULATOR 600/800XL	7.25
PRA023	RF MOD 65/130XE	14.95
PRA024	RF MODULATOR XEGM	12.00
Keyboards (internal):		
PRA002	400 MEMBRANE	10.00
PRA031	800 (NEW).....	30.00
PRA007	800XL (RECON)	25.00
PRA079	65XE/130XE/.....	30.00
PRA018	1200XL	25.00
PRA084	XE GAME MACHINE	30.00
PRA089	XE GM with case & cable	39.95

DIAGNOSTICS

PRA090	PBI Diagnostic for 130XE ...	29.95
PRA008	1050 DIAGNOSTIC DISK.....	15.00
	(NOT FOR MODIFIED DRIVES)	
PRA084	810/1050/XF551 2 HOUR TEST .	15.00
PRA009	810 DIAGNOSTIC CART.....	15.00
PRA010	SALT 2.07 400/800 CART	15.00
PRA011	SALT SE 800XL/XE CART	15.00
PRA012	CPS SUPER SALT CART	15.00
PRA014	SUPER SALT TEST FIXTURE	50.00

DRIVE PARTS

PRA061	810 SIDE WITH DATA SEPARATOR	15.00
PRA058	810 ANALOG BOARD	10.00
PRA060	810 POWER BOARD	15.00
PRA032	810 MPI DRIVE MECH	25.00
PRA033	810 TANDON DRIVE MECH	50.00
PRA034	810 PCB SET/DS/SIDE/PWR/ANLG	40.00
HDA027	810 DRIVE/BASE (NO CASE)....	50.00
PRA042	810 TANDON DOOR	8.00
PRA038	810/1050 TANDON DRIVE BELT .	7.95
PRA077	1050 WORLD STG DRIVE BELT...	7.95
PRA048	1050 TANDON TRK ZERO SENSOR.	12.00
PRA047	1050 WRLD STG TRK ZERO SENSOR	12.00
ACG087	STICK-ON DRIVE NUMBER LABELS.	1.00
PRA041	1050 DRIVE MECH TANDON	75.00
PRA088	1050 PCB	50.00
PRA072	XF5551 MECH ATARI	75.00
PRA086	XF551 MECH GENERIC	50.00
PRA087	XF551 PCB	95.00

INTEGRATED CIRCUITS

ICA296	800 ANTIC	CO12296	5.00
ICA377	800 CPU 6502	CO14377	5.00
ICA299	810 ROM C	CO11299	5.00
ICA329	810 FDC WD1771.....	CO14329	5.00
ICA099	850 ROM B	CO12099	5.00
ICA541	1050 EPROM L		5.00
ICA001	1050 FDC WD2793		19.95
ICA303	ASSEM REV B	CO60303	7.50
ICA502	BASIC REV A CHIP SET		5.00
ICA947	BASIC REV C	CO24947	12.00
ICA991	FREDDIE	CO61991	12.00
ICA805	GTIA	CO14805	5.00
ICA745	MPU 6507	CO10745	5.00
ICA499	OS ROMS (499B-599B)		5.00
ICA795	PIA 6520	CO14795	5.00
ICA750	PIA 6532	CO10750	5.00
ICA294	POKEY	CO12294	5.00
ICA328	RAM 6810	CO14328	5.00
ICA444	VCS TIA 444	CO10444	5.00
ICA697	XL/XE ANTIC	CO21697	12.00
ICA618	XL/XE MMU	CO61618	5.00
ICA598	XL/XE OS	CO61598	12.00
ICA806	XL CPU	CO14806	8.00
ICA472	XL DELAY	CO60472	5.00
ICA953	XE GATE ARRAY.....	CO25953	12.00
ICA696	XF551 ROM	C101696	15.00
ICA235	XF551 CPU	C070235	10.00

POWER ADAPTERS

PRA001	400/800/810/1050/XF551/1200XL	9.95
PRA053	XL/XE COMPUTER - 1 AMP.....	15.00
PRA006	XL/XE COMPUTER - 1.5 AMP.....	20.00
PRA029	2600VCS/XEP80/SX212	9.95
PRA017	830/835 MODEM.....	9.95
PRA026	1010 PROGRAM RECORDER.....	5.00
PRA027	1030 MODEM.....	9.95
PRA028	1027 PRINTER 1090 interface	10.00
PRA052	5200 GAME MACHINE.....	10.00
PRA050	7800 GAME MACHINE	15.00

ATHW-3

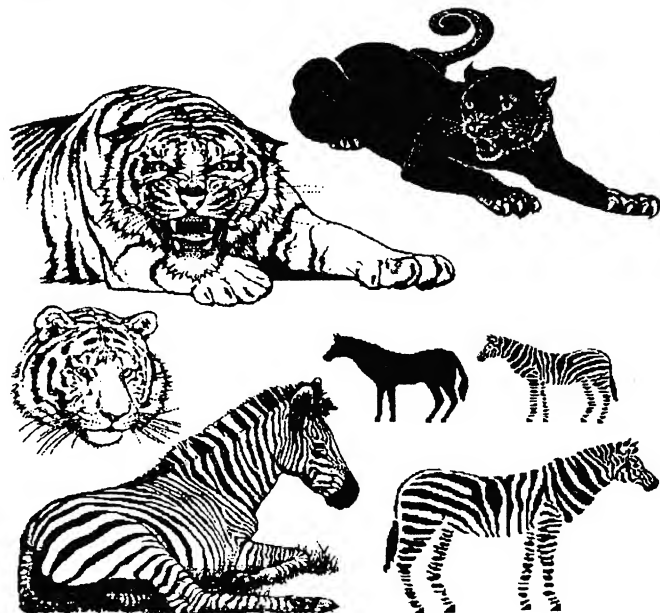
800, XL, XE COMPUTERS AND ACCESSORIES

COMPUTER ACCESSORIES

ACA079	Touch Tablet- Atari original	34.95
ACA061	XEP 80 COLUMN INTERFACE....	49.95*
PKG004	XEP80 W/Atariwriter 80	59.95*
*Requires monitor for 80 column.		
Now get true 80 column on-line with your Atari computer. You need XEP-80, a good monitor, Sparta DOS X, the Express Terminal cartridge and of course a modem.		
ACA086	MIDI MATE interface no soft	49.95
ACA037	MIDI TRACK II with software	69.95
ACA038	MIDI TRACK III for 130XE	69.95
ATD948	MIDITRACK II TO III upgrade	20.00
ACA043	R-TIME 8 clock cartridge ..	49.95
HDA054	BLACK BOX upgrade	199.95
HDA056	EPROM Programmer	169.95
ACA046	EPROM CART with BANK SELECT	14.95
PRA016	CARTRIDGE CASE FOR PRA062/65	75
PRA062	EPROM cartridge pcb 16k 2X2764	5.00
PRA065	EPROM cartridge pcb 8k 2x2532	4.00
ACA027	ANIMATION STATION	79.95
ACA078	LIGHTPEN Atari	14.95
ACA550	NUMERIC KEYPAD	9.95
ACA005	FASTCHIP For 800 (NEWELL)...	19.95
ACA023	OMNIVIEW 80 For 64/256XL ..	29.95
ACA076	OMNIMON 400/800 W. Omniview.	29.95
ACA075	OSNXL OP SYSTEM (XL/XE)	29.95
ACA025	RAMROD XL Without Omnimon ..	19.95
ACA044	RAMROD XL/XE With Omnimon ..	49.95
ACA077	RAMROD 800 With Omnimon	39.95
PKG001	AtariLab with temp & light ..	19.95
ATC045	AtariLab Starter with temp ..	14.95
ATC046	AtariLab Light add on	14.95
ACG050	POWER STRIP With 6 Outlets ..	14.95

CONNECTORS / ADAPTER

ACA045	I/O EXPANSION BOX - 3 WAY ..	19.95
PRA051	13 PIN I/O CONNECTOR FEM....	4.00
PRA015	13 PIN I/O CONNECTOR PCB MALE	3.00
PRG043	9-PIN JOYSTICK SOCKET (2) PCB	1.00
PRA074	RF TV SWITCH BOX 300 OHMS..	2.50
PRA075	RF TV SWITCH BOX 75/300 OHM	3.50
PRA076	RF DELUXE SW BOX 75/300 OHM	3.95



CABLES

CAG030	RF SWITCH BOX ELIM CABLE ...	2.00
CAA010	RF CABLE FOR 800 COMPUTER...	3.00
CAG017	MIDI CABLE 6 FT.	5.95
CAG028	MIDI EXTENDER CABLE 10'	10.00
CAA011	825 ADAPTER TO PARALLEL CABL	15.00
SPECIAL 8-BIT:		
CAA007	3 FOOT 13 PIN I/O CABLE	9.95
CAA008	5 FOOT 13 PIN I/O CABLE	10.95
CAA009	6 FOOT 13 PIN I/O CABLE	12.95
CAA001	850 TO 825 PRINTER	10.00
CAA002	850 TO PRINTER-PARLLEL.....	15.00
CAA003	850 TO MODEM	15.00
CAA004	850 TO TERMINAL	15.00
CAA005	COMP COLOR MONITOR GENERIC .	10.00
CAA006	COMP COLOR MONITOR (CX-89)..	10.00
CAA012	COMP MONO MONITOR(CX82)	5.00

OWNERS MANUALS

BKA073	400 Computer	5.00
BKA074	800 COMPUTER	5.00
BKA070	600XL COMPUTER	5.00
BKA071	800XL COMPUTER	10.00
BKA056	XEGM COMPUTER	10.00
BKA081	65XE/130XE COMPUTER	10.00
BKA076	810 DISK DRIVE	5.00
ATD840	1050 DISK DRIVE W/DOS 2.5...	10.00
ATD844	XF551 DISK DRIVE W/DOS XE ..	10.00
BKA082	XMM-801 Printer	10.00
BKA069	XDM-121 Printer	10.00
BKA080	820 PRINTER	5.00
BKA075	825 PRINTER	10.00
BKA079	850 INTERFACE	5.00
BKA078	1010 PROGRAM RECORDER	5.00

BOOKS

BKA001	YOUR ATARI COMPUTER	12.95
BKA036	DE RE ATARI	14.95
BKA013	BEST OF ANTIC/ANTHOLOGY	12.95
BKA034	ATARI BASIC REFERENCE MANUAL	5.00
BKA040	DOS II REFERENCE WITH DISK ..	10.00
BKA014	MASTER MEMORY MAP	10.00
BKA066	MASTER MEMORY MAP ABREV.....	4.95
BKA046	400/800 TECH. REF. NOTES SET.	10.00
BKA050	1200XL SUPPL. TO TECH REF ..	5.00
BKA051	810 DOS UTIL. SOURCE LISTINGS	5.00
BKA045	850 TECHNICAL MANUAL	10.00
BKA039	ASSEMBLER EDITOR MANUAL	10.00
BKA068	SPARTA DOS CONSTRUCTION SET .	19.95
BKA043	101 PROGRAMMING TIPS/TRICKS	5.00
BKA067	KIDS ATARI BASIC MANUAL	5.95
BKA016	ASTROLOGY (WITH DISK)	7.95
BKA015	ASTROLOGY (YOU TYPE)	5.00
BKA021	ATARI BASIC (SELF TEACHING).	5.00
BKA012	COMPUTER PLAYGROUND	9.95
BKA018	FORTH ON THE ATARI	5.00
BKA060	BASIC LEARN BY USING W/DISK.	7.95
BKA017	BASIC LEARN BY USING	5.00
BKA061	GAMES FOR THE ATAI W/DISK ..	7.95
BKA057	GAMES FOR THE ATARI	5.00
BKA059	HOW TO PROG IN 6502 ML W/DISK	7.95
BKA044	HOW TO PROG IN 6502 MACH LNG	5.00
BKA029	PROGRAM DESCRIPTION I	3.95
BKA032	INSIDE ATARI BASIC	5.00
BKA031	KIDS AND THE ATARI	11.95
BKA063	LOGO REFERENCE MANUAL SET ..	10.00
BKA035	MICROSOFT BASIC II REF.....	10.00
BKA053	PILOT STUDENT REF. GUIDE ...	5.00
BKA054	PILOT PRIMER (TEACHERS)	5.00
BKG025	QUEST FOR CLUES	24.95

ATHW-4



A-T-A-R-I



Answers, Tips And Relevant Information

UTIL.EXE, Touch Tablets, AtariWriter+ Companion

Paul V. Alhart

UTIL.EXE Addendum

Last A-T-A-R-I I talked a little about UTIL.EXE. This great utility by Charles Marslett configures you PC's floppy drive to read/write/format Atari double density disks. While using my PC at work to read several long Atari files I occasionally got a few read errors. I had back up copies of these files on the flip side of the same disk and noticed I never got any errors when reading these back up files. Ah Ha! I put a write protect tab on the disk and tried again. No luck. On a hunch I put a write protect tab over the sector index hole of the disk. This is the round hole hear the hub. Bingo! I was then able to consistently read all the files with no errors. With the index hole covered, my PC floppy drive will still read & write properly to the Atari disks, but will not format them. I hope this tip will help other users of UTIL.EXE

Atari Touch Tablet Conversion

I have never been able to draw. Back in elementary school where my favorite Aunt was the art teacher, I still failed art class. Nevertheless, a Koala Pad has been an indispensable part of my computer hardware for many years. No longer do I draw stick figure birds and such, but instead use the Koala Pad for tasks like drawing electrical schematics to accompany my A-T-A-R-I columns. A back up pad seemed like a good idea, but I was never able to find one. I did however find an Atari Touch Tablet at a garage sale. It looked clean and the price was right so I took it home and plugged it in. That's when I learned that there is a slight difference between the Koala Pad and the Atari

Touch Tablet. The vertical output is reversed. Using my Koalapainter software, when I moved the pen up, the cursor moved down. Also, the button on the pen performed the function of the right tablet button. I would prefer it to perform the function of the left button. Many software packages like Print Shop let you select which input device you are going to use so this is normally not a problem. Since I didn't get any software with the Touch Tablet, and was quite happy with the Koalapainter software I was already using, it was a problem for me. The Touch Tablet got put away and forgotten for some time.

The Rest of the Story

Last Christmas Santa decided to let me buy myself a new oscilloscope. Like a kid with a new toy I started probing everything I could find. One of those things was that forgotten Atari Touch Tablet. In the process I discovered that I could modify it to emulate my Koala Pad. It could be hard wired to emulate the Koala Pad but I chose to add a TPDT switch so I could go back and forth between the two. I am not going to present you with a step by step procedure at this time. I will however tell you what needs to be done. If there is enough interest I'll include a step by step in a future A-T-A-R-I.

The touch pad plugs into connector CN3. Pins 2 & 3 need to be reversed. NOTE: pin 1 is nearest the center of the PC board. I found the easiest way to accomplish this was to remove CN3 from the board, fold pins 2 & 3 back out of the way, and reinstall CN3. Use hook up wire to connect pins 2 & 3 to the PC board CN3 traces 3 & 2. This takes the vertical problem.

The pen is connected to the PC board at CN4. You will need to cut the trace that runs from CN4 to the switch logic. Looking at the solder side of the PC board the trace to cut runs down from the right edge of CN4 and is about 1 inch long. Solder a piece of hook up wire to the CN4 side of this cut trace. Directly below CN4 you will find 4 solder pads in a vertical line. Connect the other end of the wire to the right most pad which is the left switch logic.

AtariWriter+

Judging by my mail, none of my A-T-A-R-I columns generate as much interest as those that deal with AtariWriter+. Over the years these columns have appeared in ANTIC, AIM, and AC and have included many useful tips as well as several type-in programs to modify the AW+ disk. Things like presetting the Global defaults and screen colors, disabling the RS-232 loader, speeding up the key repeat rate, and adding your own custom screen fonts and printer drivers are just a few of the topics that have been covered. Due to popular demand, all my past AtariWriter+ related articles and type-ins have been gathered together and put on disk.

The AtariWriter+ Companion contains 10 informative full length columns and 6 ready to run BASIC programs. See what you have missed. See what amazing things you can coax AtariWriter+ to do. Order your copy of **The AtariWriter+ Companion** today for only \$5 from:

Paul V. Alhart
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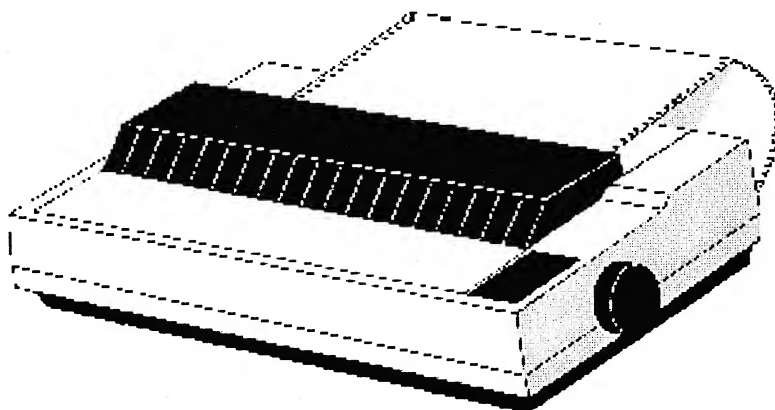
ENVELOPES, TEXTPRO, ATARIWRITER PLUS AND THE JUKI 6000 PRINTER

by Rolly Herman

Most of us that write letters, texts, and documents, use word processing programs that we have mastered well enough to suit our needs. The text is usually printed out on standard sized paper; often tractor feed paper. But what about envelopes? I know the answer. Print up a batch of labels for a large mailing and stick the labels on the envelopes. That is fine. But what about the occasional letter to mom, or to a friend, or to the retail store about a billing error? A single envelope doesn't work well in a typical older model tractor feed printer (some of the newer printers do accommodate envelopes). And printing up a single label is more trouble than it is worth. You may as well address the envelope by hand! Here is my solution to the envelope problem.

I am using my Atari 130XE with a Star NX-10 dot matrix printer loaded with tractor feed paper. That is for the letters or documents. I have set up a Juki 6000 daisy wheel printer with an A-B switch so that I can switch back and forth from the tractor feed printer to the Juki. The Juki does NOT have a tractor feed. It was designed for single sheets of paper. The roller works like an old fashioned typewriter, and has an adjustment for the tightness holding the paper. It readily accepts envelopes and it works well with them. There is only one problem. This printer was the bottom of the Juki line, and it has no bells or whistles. One of the features that is missing is a bank of DIP switches. DIP switches are used to configure a printer to a particular computer. The factory setting for this printer is NOT set for our Atari 8 bit

Got a non-standard printer on your word processor? Here is one users solution.



computers. It does NOT do an automatic line feed with a carriage return. Therefore, if no special codes are incorporated in the text, it will not do any line feeds and will type each line over and over on itself. I assume that a printer driver could be made up for it to take care of this problem. However, it is compatible with the Star driver in all respects except this line feed, and if it had a different driver, I could not switch back and forth easily.

There is a rather simple solution. It is the ASCII code 34; the quote symbol. That is the code needed to send to the Juki to have it do a line feed with a carriage return.

I use Textpro and AtariWriter Plus as my two favorite word processors. I will describe the methods for using envelopes with the Juki with each of them.

For TextPro, there are several ways to do it:

METHOD A

1. On the top line of the text, press the escape key twice [ESCAPE] [ESCAPE] then press the shift key and the numeral 2 [SHIFT] [2]. These key strokes will create the escape symbol and the quote symbol on the screen.

2. Type in the Textpro codes for the top and bottom margins, and type in your return address.

3. Type in the proper spacing to the right and down so the addressee is centered on the envelope, and type in the addressee;

4. Save this as a file.

5. Anytime you need to address an envelope, just put it in the Juki, load the file, and just change the addressee.

METHOD B

1. Press control and the semi-colon key. Then answer YES to the three questions.

- 2 Follow steps 2 through 4 as above.

METHOD C

1. Make print keys for the escape key and the quote key. Escape is decimal 27, and quote is decimal 34.

2. I used INVERSE 1 for the escape key and INVERSE 2 for the quote key. Any inverse numeral or inverse upper case letter may be chosen. To produce the inverse characters, Press SELECT and the chosen numerals or upper case letters.

3. To define the print keys, go to the top of the document and type [First Inverse character] [=] [27].

4. On the next line type [Second Inverse Character] [=] [34].

5. On the next line type the first inverse key and the second inverse key.

6. If <> signifies inverse, here is how mine looked:

<1>=27

<2>=34

<1><2>

Text:

7. Save the file, or Save as a configuration file by pressing SELECT CONTROL S and giving a suitable Drive number and name. The file will have an extension of CNF on it. See the TextPro doc for further details.

For AtariWriter Plus, at the top of the text, type [Control] [O] [27] [Control] [O] [34].

The control O is the equivalent of escape in AtarWriter Plus, and the 34 is the equivalent of the quote key.

Then set up the margins for your return address and the spacing for the addressee. Then SAVE the file.

I have saved these files on the corresponding word processing disks, and I use them whenever I need to print out envelopes. If the letter is a formal type of business letter with the addressee typed in, I even save key strokes by merging the address into the envelope file. Here's how:

1. Save your letter to disk or RAMDISK;

2. Load the envelope file;

3. Merge the letter file with the envelope file at the addressee location;

4. Delete everything before the addressee, and everything after the addressee;

5. Set up the Juki printer with the envelope and print it out.

The codes mentioned above do not print out on the envelope. I set the top margin and the left margin to zero for my return address. Depending on the size of the envelope that I use, I set the page length, a new left margin and I skip a few lines for the addressee so it is centered on the envelope.

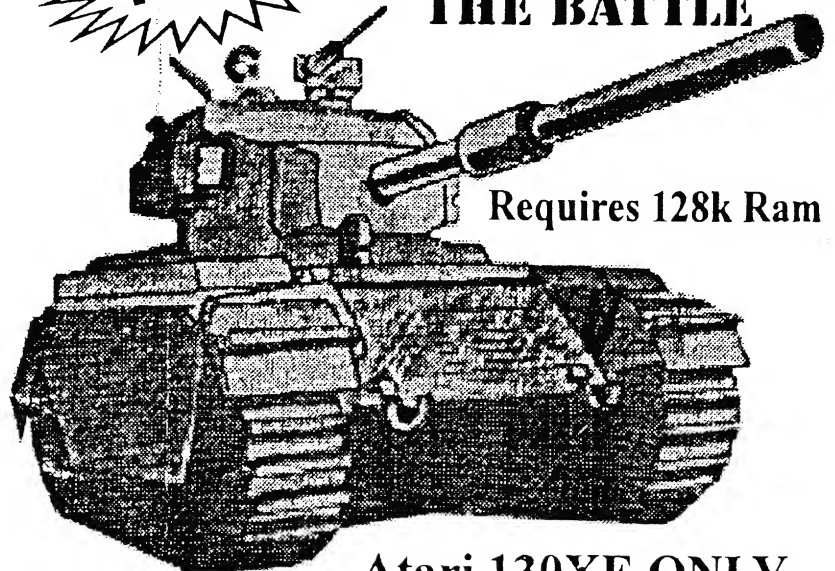
I hope that this helps solve the envelope problem.

MICRO-DISCOUNT

The complete Mail Order service for Atari XL/XE users



28 th February 1995



Requires 128k Ram

Atari 130XE ONLY

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SmartOS

The Hack

SmartOS is a RAM chip that is powered by the Dallas Smart Socket. This "socket" is actually a small PC board with logic and a backup battery that is built into a standard IC socket. Once a low powered CMOS RAM is inserted in the socket, the battery maintains the data in the RAM for up to 10 years—making it equivalent to an EEPROM or EPROM. Once the RAM is loaded, you can power off your computer, go on a two week vacation and everything you did will be there when you power on again. The beauty of this setup is that the RAM is just that, RAM. You need no special sequencing to write to it, no "programming", nothing. This is a perfect way to do last month's Nir-PAL OS changes without the necessity of burning a new EPROM (along with a hundred other things...).

More Features

In addition, the creator of this hack just couldn't resist throwing a programmable internal cartridge in there—as well as the address space from \$D600 to \$D7FF. This gives you the ability to boot with something other than BASIC rev.B as your internal cartridge. Normally, you boot into BASIC when you power on your XL/XE, unless you hold down OPTION.

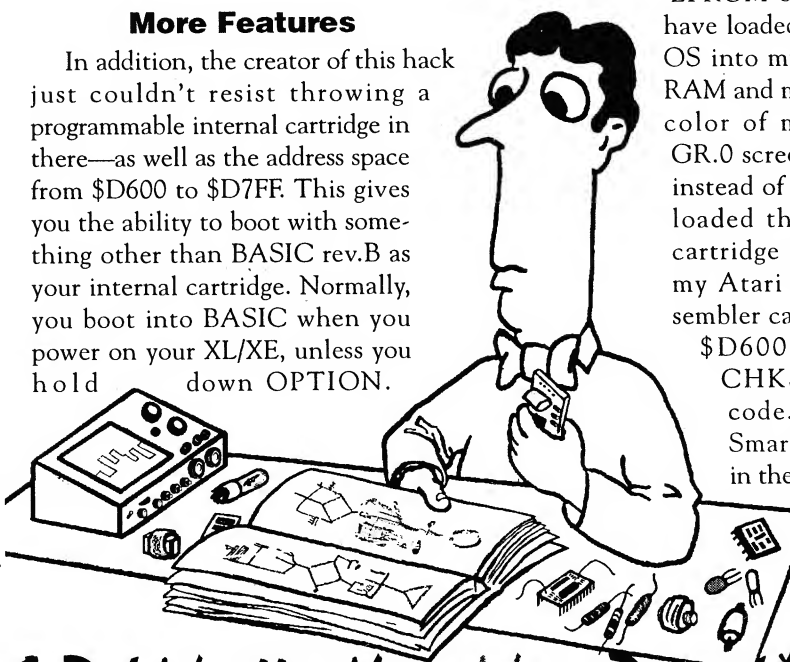
With a programmable internal cartridge, you can boot into any 8K cartridge on power up. Just load the internal cartridge space with code and you're set! Your custom cartridge will survive power down as well as errant code trying to overwrite what you have loaded—just like the ROM that it replaces. Also, the 512 bytes at memory location \$D600 thru \$D7FF, which are normally not available, will now function as persistent RAM—great for those routines that won't fit anywhere else. The SmartOS will work in any of the XLs or an XE, with a little extra work required on a 1200XL. It will not work on a 400/800—sorry.

What Does It Do?

The upgrade allows you to switch select two functions. The first switch selects whether you use your OS ROM (for those functions that your new OS does not get along with) or use the SmartOS. The second switch write protects the RAM in the OS and internal cartridge address space (\$D600 – \$D7FF are always writable). To give you a little more insight into how SmartOS functions, let me take you thru my current setup. I have the standard 800XL OS in ROM in my SmartOS board (any OS may be used if it is just a 16K

EPROM or ROM). I have loaded this Atari OS into my SmartOS RAM and modified the color of my default GR.0 screen to green instead of blue. I also loaded the internal cartridge space with my Atari Editor/Assembler cartridge and \$D600 with the CHKSUM.OBJ code. With the SmartOS switch in the ROM position, my 1200XL boots up in blue with BASIC (unless I hold down

Have you ever wanted one of those nice ramdisk handlers built right into your operating system? How about a high speed SIO routine hiding in your OS code that you can use with your USDoubler? Maybe you needed the 400/800 OS for a favorite oldie that will not run on the XL operating system? Re-define the function keys right in the OS on your 1200XL? Modify the OS for Nir-PAL or the 65816? Built in monitor? Basic extensions? The list goes on and on. When these types of hacks are right in the OS, they don't take up any of your memory, don't require loading from disk and work with almost any DOS. So, how come you don't have them? Well, the reason you don't have any or all of these features now is twofold: you need an EPROM burner to make the OS EPROM and you can't put everything in one set of code (and expect it to work with a reasonable number of programs). This means that you would be required to open up your computer and change OS chips or have some sort of kludge, switching thing under the covers. What the average user needs is an upgrade that allows him to easily load any OS he requires at the moment and make it permanent thru power cycling (without buying an EPROM burner and burning dozens of OS chips). If you have something like that, you can whip up any kind of OS hack you like, effortlessly! So, here it is...



A Bob Woolley VaporWare Project*

*These projects tend to remain unfinished. Proceed at your own risk.

OPTION, then it boots to DOS—just like any other XL). In the RAM position, the system boots a green screen with ED/ASM running (or DOS if I hold OPTION). Placing the SmartOS write enable switch in the “on” position will allow me to make any OS or cartridge code changes I wish; while leaving it “off” protects them unconditionally. With CHKSUM.OBJ in persistent RAM at \$D600, anytime I want to re-calculate the OS checksum, I can GD600 from DEBUG without loading the CHKSUM.OBJ from disk. Of course, YOU can do whatever you want with your OS, internal cartridge and the 512 bytes at \$D600. And, I am not limited to just my current configuration—a few minutes of disk action and I can have anything my little heart desires. Like the drivers for an IDE drive. A ramdisk handler. Floppy interface code. You name it. You write it. You load it. No EPROMs, no EPROM burners, no waiting.

Operating Secrets

OK, so how does this work? As I mentioned, the heart of this project is a Dallas SmartSocket. This intelligent device watches the power supply for any low voltage conditions. When it “sees” the +5 volts heading towards zero (which means the power has been turned off), it disables writing to the RAM and switches in its internal backup battery. This keeps a glitch from writing garbage as the power falls and you lose logic integrity (as well as during power up, for the same reason). On powerup, once power is stable, the SmartSocket enables writing to the RAM, disconnects his battery and off you go. The socket does not come with a RAM chip installed—you provide that. There are versions that include the chip in an integrated package, but I like the ability to replace a bad RAM without throwing away the whole package. You also may need to dump the contents of the RAM and the only way to do that may be to unplug it from the SmartSocket! I used a 32Kx8 RAM on SmartOS, which gives me an extra 16K bytes to put things in, like the internal cartridge and \$D6xx. These

SmartSockets come in capacities up to 512K bytes—maybe a nice permanent ramdisk for some future hack?

Techie Talk

So, this SmartSocket is wired in parallel with the existing OS ROM socket—pin for pin. Except for the -CS, R/W lines and the A14 address bit (refer to the schematic in Figure 1). The remaining circuitry has two sections, chip select and write enable.

Chip select is generated at U1, pin 8 and switched to either the RAM or ROM thru the SPDT switch. See the -OS line from the board that used to go directly to pins 20 and 22 on the OS ROM? This connection needs to be opened and re-routed to pin 12 of U1 where it will be ANDed with the internal cartridge and \$D6xx memory selects. From there, notice that 02 clock enables -CS to the memories (pin 9 of U1). Running fast RAM *without* 02 gating will cause subtle errors due to address bit skew. Pins 1,2 and 13 of U2 supply the remainder of the -CS logic. If either -\$D6xx, -\$D7xx or -BASIC are active, A14 of the RAM is driven high, and -CS is generated. This has the effect of reading the OS ROM when you are switched to ROM and you read any of those three areas (internal BASIC, \$D6xx or \$D7xx). You can verify this with ED/ASM. At \$D600, you will see the code from the OS ROM at \$F600! For this reason, the BlackBox and any other hacks that enable \$D6xx will probably not work on SmartOS—regardless of where you place the RAM/ROM switch. If you face this problem, disable \$D6xx (and \$D7xx, if necessary) by disconnecting U2, pin 1 (and 2 -\$D7xx) and wiring it to pin 13 (don’t just leave it open...!) Also disconnect the corresponding pin on U2, pins 9 and 10 (connect them to pin 11).

The write enable section controls the R/W line to the SmartOS and internal BASIC portions of the RAM. You need to be able to modify or load code in these addresses, but once loaded, they must not be allowed to be altered. \$D600 - \$D7FF are enabled for writing thru pins 9 and 10 of U2, while

the switch wired to pin 11 of U2 enables all of RAM to be written. R/W is gated at pin 5 of U1.

Wiring It Up

OK, enough theory stuff—let’s list some source pins. As stated earlier, all the lines from the OS ROM are connected to the Smartsocket except for pins 1, 20, 22, and 27. On my upgrade, I used the second ROM site on a 1200XL for the SmartSocket, cutting away the pins that were altered and adding point to point wiring. I have also used a rip-off board on an 800XL, plugging into the OS ROM site. Either way, the wiring is similar (and will be covered next issue). The remaining connections to the computer are:

Line Name	Source
-OS	pin 15 CO61618
-\$D6xx	pin 9 74LS138
-\$D7xx	pin 7 74LS138
-BASIC	pin 13 CO61618
+R/W	pin 36 CO14806
+02	pin 39 CO14806

And, of course, you need +5 volts and ground. Don’t forget to pull the internal BASIC ROM, if you have one. I have used the Atari part numbers for the chips, although a 1200XL does not have a CO61618 chip (it’s CO60609). To do this hack on a 1200XL requires you to replace your 60609 with a 61618 (as well as a little more wiring), OK? If you haven’t done this to your 1200XL, check in next issue or write to me.

Parts list:

74HC00	4x2 NAND
74HC10	3x3 NAND
switches	SPST and SPDT
4.7k	1/4w resistors
DS1213C	Dallas SmartSocket
60L256/43256	32Kx8 low power static RAM

Making It Work—the OS

Once you complete construction, it takes a little fooling around to get the RAM loaded. Since you will be starting with random data in RAM, you ob-

viously cannot boot your computer with the switch set to RAM—you must start off in the ROM position. So, place the RAM/ROM switch in the ROM position and the R/W switch in disable (writing inhibited). The computer should boot OK in this configuration, no matter what you have in the RAM. You will not have an internal cartridge. The first step is to prepare an OS to load into the RAM. Let's just use the OS that's in your existing ROM.

MVROM.OBJ

Plug in your ED/ASM cart and boot DOS 2.0. Do not use any other DOS unless you are positive that it will not overwrite \$4000 and above! It would be nice to be able to just go to DEBUG and move the OS to \$4000 from \$C000, but that will certainly not work. The OS hides some code in \$5000 that you need to move along with the \$C000 data. For this function, I have included a short M/L program called MVROM.OBJ. This routine properly copies your OS code into location \$4000 where it can be modified and/or written back into SmartOS RAM.

```
0100 ; ***MVROM.ASM 8/02/95***
0110 ; MOVES ROM INTO MEMORY
0120 ;
0130 *= $0600
0140 ;
0150 LDA #$00
0160 STA $CB
0170 STA $CD
0180 LDA #$C0
0190 STA $CC
0200 LDA #$40
0210 STA $CE
0220 LDX #$FD
0230 LDY #$00
0240 ;
0250 LP1 JSR MOVEPAGE
0260 BEQ COMPLETE
0270 CMP #$D0
0280 BNE LP1
0290 ;
0300 LDA #$50
0310 STA $CC
0320 ;
0330 LP2 JSR MOVEPAGE
0340 CMP #$58
0350 BNE LP2
```

```
0360 ;
0370 LDA #$D8
0380 STA $CC
0390 BNE LP1
0400 ;
0410 MOVEPAGE LDA #$7D
0420 STA $D301
0430 LDA ($CB),Y
0440 STX $D301
0450 STA ($CD),Y
0460 INY
0470 BNE MOVEPAGE
0480 ;
0490 INC $CE
0500 INC $CC
0510 LDA $CC
0520 RTS
0530 ;
0540 COMPLETE BRK
```

To use this program from EDIT, Load MVROM.OBJ. Go to DEBUG and run MVROM.OBJ with G600. At this point, you can verify that your OS is now sitting in \$4000 thru \$7FFF. If you are going to make any changes to the Atari OS, you *must* re-calculate the checksum values stored in the code (see CHKSUM.OBJ). For now, just use the OS without modifying it.

MVRAM.OBJ

To copy the OS back into the SmartOS RAM, you need to use MVRAM.OBJ. This routine not only allows the OS to be returned to its proper addresses, but allows for you to transfer control of \$C000 - \$FFFF to RAM while you are running.

```
0100 ; ***MVRAM.ASM 8/02/95***
0110 ; MOVES MEMORY INTO
RAM
0120 ;
0130 *= $0600
0140 ;
0150 PHP
0160 SEI
0170 LDA $D40E
0180 PHA
0190 LDA #$00
0200 STA $D40E
0210 ;
0220 LPSTART LDA $D01F
0230 CMP #$06
0240 BNE LPSTART
```

```
0250 ;
0260 LDA #$00
0270 STA $CB
0280 STA $CD
0290 LDA #$C0
0300 STA $CC
0310 LDA #$40
0320 STA $CE
0330 LDX #$7D
0340 LDY #$00
0350 ;
0360 LP1 JSR MOVEPAGE
0370 BEQ COMPLETE
0380 CMP #$D0
0390 BNE LP1
0400 LDA #$50
0410 STA $CC
0420 ;
0430 LP2 JSR MOVEPAGE
0440 CMP #$58
0450 BNE LP2
0460 ;
0470 LDA #$D8
0480 STA $CC
0490 BNE LP1
0500 ;
0510 MOVEPAGE LDA #$FD
0520 STA $D301
0530 LDA ($CD),Y
0540 STX $D301
0550 STA ($CB),Y
0560 INY
0570 BNE MOVEPAGE
0580 ;
0590 INC $CE
0600 INC $CC
0610 LDA $CC
0620 RTS
0630 ;
0640 COMPLETE PLA
0650 STA $D40E
0660 PLP
0670 LDA #$FD
0680 STA $D301
0690 LOOP JMP LOOP
0700 .END
```

This routine is basically the opposite of the MVROM.ASM code except for the initial setup from lines 150 thru 240. Lines 150 thru 200 disable all interrupts. We need to switch off the existing OS and there will be no code for an interrupt to execute—so, off they go. Lines 220 thru 240 wait forever for us to push the STAR key. This gives you an

opportunity to set the ROM/RAM and write enable switches before you load the RAM. Once you push START, the code from \$4000 - \$7FFF is loaded into \$C000 - \$FFFF and the computer is locked in a tight loop. This final loop is to allow you to disable writing to the RAM. Be sure that you do this or you may find some of your code overlaid when you re-boot.

So, from ED/ASM again, you should have loaded something into \$4000 - \$7FFF (hopefully a valid OS). Load MVRAM.OBJ and go to DEBUG. G600 to execute MVRAM—the computer will hang, waiting for the START key. Set the switches to enable write and RAM. Ignore the screen garbage.... Push the START key. *Disable* write! Re-boot on RAM—you should boot OK. Notice that you do not need to use MVRAM to load the OS code for MVRAM. If you have a ROM image on disk, you can load it into \$4000 directly. In fact, this would be your normal procedure once you create a number of OS images that meet your needs. In this case, the MVRAM.OBJ code could be appended to the OS image, with a run address of \$600—making an OS change a one step operation.

SETCART.ASM

To load the internal cartridge, you must be able to boot with the internal cartridge enabled and no cartridge plugged in. If the current contents of the internal cartridge will not allow you to boot (see below), use ED/ASM and run SETCART.OBJ as follows:

Boot ED/ASM cartridge. Load SETCART.OBJ—screen will go off. Enable write. Push the START key. *Disable* write! You should now be able to boot from RAM with no cartridge and the internal cartridge enabled.

```
0100 ; **SETCART.ASM 8/09/95**
0110 ;   LOADS $BFFC IN CART.
0120 ;
0130   *=   $0600
0140 ;
0150   SEI
0160   LDA #$00
0170   STA $D40E
0180   LDA #$FD
```

```
0190   STA $D301
0200 ;
0210 LPSTART LDA $D01F
0220   CMP #$06
0230   BNE LPSTART
0240 ;
0250   LDA #$FF
0260   STA $BFFC
0270 LOOP JMP LOOP
0280   .END
```

Loading a Cartridge

Once you are ready to load the internal cartridge RAM:

Boot to DOS, no external cartridge. Enable write. Load the cartridge image directly into \$A000 with DOS. *Disable* write. When you boot your computer, the internal cartridge should be functional if you did not press OPTION while booting.

Permanent RAM

The last operation that you may wish to do is load code into the new RAM at \$D600 thru \$D7FF. This RAM is used just like any other RAM location as long as you have the ROM/RAM switch in the RAM position. These addresses are always enabled for writing and no special precautions must be taken to load them. Use them for data, tables or code any time you want—the data will survive power off and cold boots forever (or, your money back... :)

Things to Ponder

Some quirks to be considered when using SmartRAM:

The OS tests all 48K of lower memory when you do a cold boot. If the SmartRAM is write enabled during a cold boot, this memory test will zero the entire internal cartridge RAM area. This not only wipes out your internal cartridge, but also causes any subsequent cold boots to fail. It seems that the OS checks for a cartridge by two methods, one of which is to look for \$00 at location \$BFFC. If you have written a \$00 in there (from the RAM test), you set the cartridge flag. This branches you into the checksum routines for the cartridge (which has been wiped out!). No matter if you hold down OPTION

or not, the code tries to checksum a non-existent cartridge. Rats—you now cannot boot with SmartRAM selected unless you have a real cartridge plugged into the cartridge port. And, with a cartridge plugged in, you cannot write into the SmartRAM cartridge area... Hmmmmmm.... This is the reason you need SETCART.ASM. This little routine does nothing other than store \$FF into the SmartRAM cartridge area at \$BFFC. This allows you to boot with SmartRAM enabled and no cartridge plugged in—which you need to do in order to load code into the SmartRAM cartridge area (\$A000-\$BFFF).

The OS code calculates the checksum of all the bytes in ROM every time you boot your computer. When you are making modifications to the OS, you must therefore re-calculate this checksum and store it in the appropriate locations of the OS. Otherwise, you will be presented with the self-test screen every time you power on. To make it easier to re-calculate and store the checksum, I have included some .OBJ code that does a nice job of automatically correcting your checksum. It was given to me by Tim Patrick and has been very useful over the years, so I hope he doesn't mind if I pass it along to the rest of the users. Unfortunately for you subscribers that did not order disks, I do not have the CHKSUM.ASM code, only the .OBJ, so you will need to D/L it from CIS or your local BBS (if they have it). For disk subscribers, there are two versions of CHKSUM—one that uses \$600 and one that resides in \$D600 (permanent SmartRAM). CHKSUM.OBJ runs from \$600, while CSUMD6.OBJ runs from \$D600.

Coming Attractions

OK—that's about all for this issue. There should be enough information here to get some of you guys up and running. Next issue, I'll go over in some depth just how to build one of these upgrades. I'll cover the use of the tools you will need, special 1200XL modifications, PCB layout, construction techniques and integrating this hack with the IDE interface (IDE interface... *what* IDE interface?)

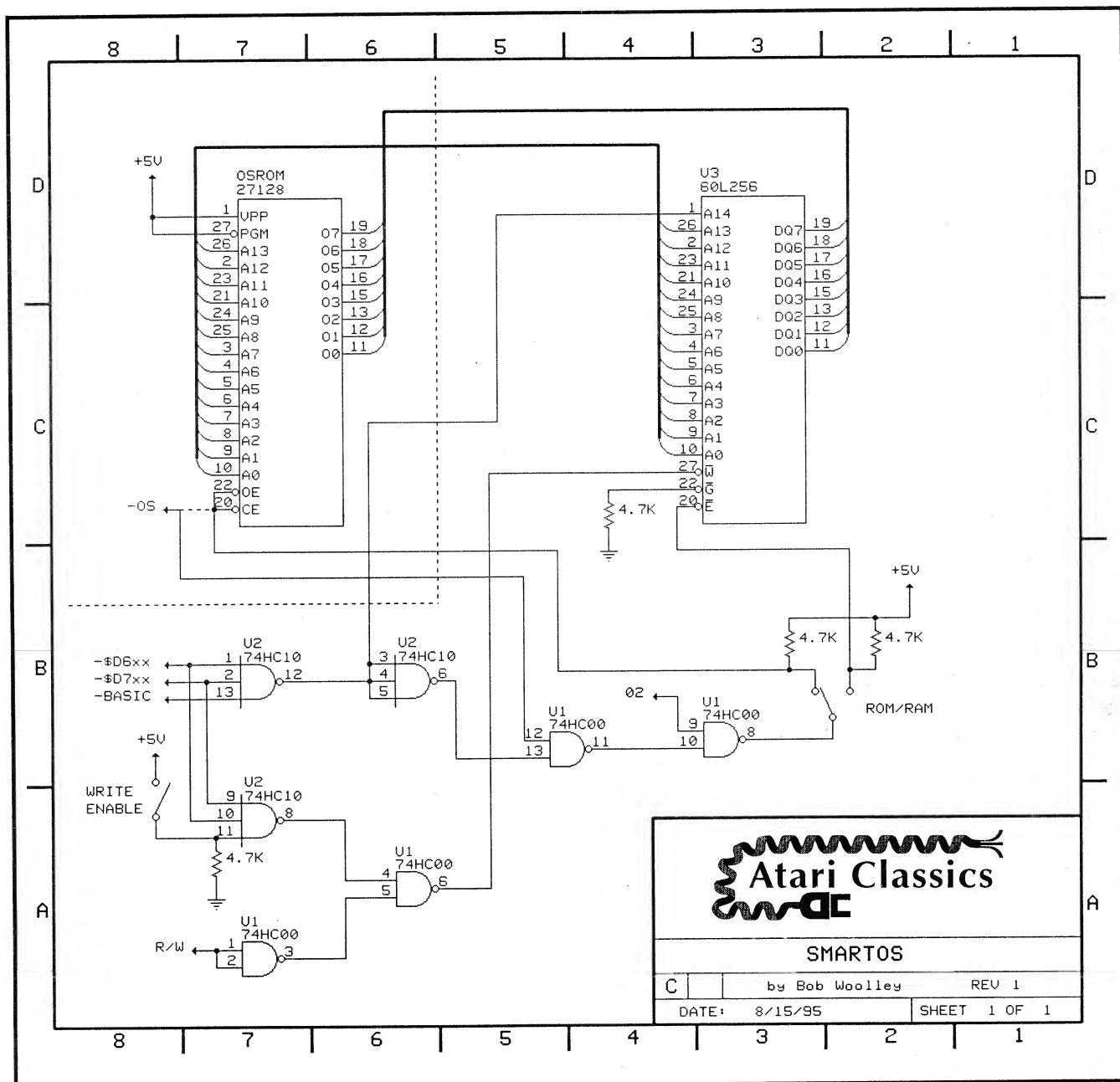


FIGURE 1.

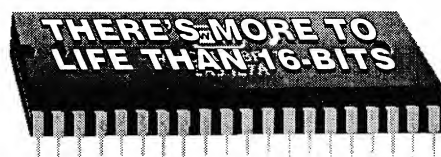
This is a hardware modification that will give you the ability to easily modify the code in your OS and save it permanently in a RAM module. The key element of this upgrade is a clever piece of hardware from Dallas Semiconductor called a SmartSocket, from which I shamelessly stole the name of this hack, SmartOS. The project will be presented in two parts, overview and detail. The first installment will contain enough information for an experienced hardware buff to build a SmartOS along with the code segments required to set it up. The second half of the series will be more of a primer for you less handy folks out there. It will include tools and test equipment use, construction techniques, general sources for parts and goodies, and have lots of pictures to follow. With them, you should be able to get yourself into real trouble!

PROGRAMMING THE 65816

James Hague

Part 2: Pushing the Limits

The differences between the 6502 and the 65816 aren't quite as simple as they seem, especially from a low down 'n dirty "I wanna write the smallest and fastest code possible" point of view. Or maybe just from the "I want to write simple, clean code that works" point of view. (I learned assembly language from those games they used to print in *ANALOG Computing*; they were never flat-out optimized for speed but I never complained about them running slow.)



Remember, registers on the 65816 can be set to either 8 or 16 bits via the REP and SEP instructions. Littering your code with size-switches is messy. And slow: REP and SEP are two byte instructions that take three cycles apiece. So ideally you'd like to just set everything to 16-bits and leave it at that. Using words instead of bytes for all variables is a good first step.

But the Atari computers have deep roots in an 8-bit world. Hardware registers are 8-bits. ATASCII characters are 8-bits. And so on. How are these situations best dealt with from a speed and size angle? The rule is to stick with the ideal, to avoid changing register sizes when at all possible.

Suppose you want to load the value at SDMCTL (decimal 559). With a 16-bit accumulator, LDA SDMCTL does get the value at address 559. It also gets the value at

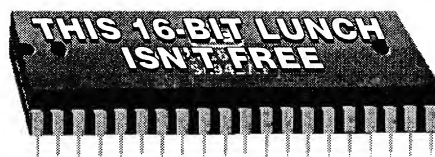
address 560, though. Rather than switching the accumulator to 8-bits, it's easier to throw away the unwanted byte with AND #\$00FF. This solution comes in at half the clocks and cycles of two size switches.

An opposite sort of trick works for 8-bit stores. A 16-bit STA COLOR0 (decimal 708) goofs up COLOR1 in the process. But wait; you can think of a 16-bit store as two 8-bit stores. The low byte of the accumulator goes into COLOR0 and the high byte into COLOR1. Two color registers with one store! COLOR0 through COLOR3 can be set to values of \$01, \$02, \$03, and \$04 with just four instructions:

```
LDA #$0201
STA COLOR0
LDA #$0403
STA COLOR2
```

Lots of hardware registers and operating system addresses are conveniently adjacent for this sort of trickery: the display list address, the P/M horizontal position registers, audio frequency and control registers (set a complete sound with one STA!), the interrupt vectors, etc. Sometimes you can even do a 16-bit write into an 8-bit address if you don't care about messing up its next door neighbor. STZ SDMCTL turns off ANTIC, but it also sets the low byte of the display list (SDLSTL) to zero. That might be okay, because the ANTIC will be turned off at the same time. Watch out, you can get yourself in trouble!

Dealing with ATASCII strings throws a medium-sized possum into the works. Reading arbitrary characters can be done with the AND #\$00FF trick, but writing them is not so easy. Sometimes you can't avoid dropping the accumulator down to 8-bits. That's not so bad, especially if you can do so before a loop and don't switch back until the loop is finished.



"LDA #1" with an 8-bit accumulator and "LDA #1" with a 16-bit accumulator look like the same instruction, but they aren't. They both load the accumulator with 1. They both have operands of \$A9. But, as we talked about in Part 1, the operand for the second instruction is one byte longer than that of the first. Now for the kicker: it takes one cycle longer to execute as well.

In fact, all instructions that deal with memory as 16-bits, including immediate instructions, take one

OOPS!

What We Meant To Say...

Last issue in Part One of this article, on page 29, "the cleaner alternative" should have been:

```
JMP (TABLE,X)
not
JMP (TEMP,X).
```

Sorry 'bout that.

more cycle to execute than they do with the accumulator set to 8-bits. The same thing applies to the index registers when they are used to access memory as 16-bits. STX COLOR0 takes four cycles with 8-bit index registers and 5 cycles with 16-bit index registers. Worst of all are the INC, DEC, shift, and rotate instructions, when used with memory operands. They take two cycles longer in 16-bit mode, because they do both a read and a write and one cycle gets tacked on to each part. Instructions that don't deal with memory, like CLC and TXY, aren't affected by this.

The upshot of all this rambling is that sometimes it's better to switch to 8-bit register sizes, especially in loops. Switching the accumulator to 8-bits before and after a loop takes six cycles. If there is one LDA and one STA inside the loop, and the loop is executed 100 times, you'll gain 200 cycles by running with an 8-bit accumulator. If you are dealing solely with 8-bit values, of course. Subtract the overhead of the size switching and you still have a savings of 192 cycles. Sometimes this can make a big difference.



The X and Y registers are most often used as loop indices. They can be used in the same way when dealing with 16-bit memory, but you have to remember to increment or decrement them twice, because you are operating on words. This little routine clears missile memory to zero:

```
LDX #254
LOOP STZ MISSILES,X
DEX
DEX
BPL LOOP
```

There are a couple of things to note about this wee bit o' code. The usual 6502 trick of starting X at count-1 and terminating the loop when it goes negative still works in principle. But because the loop operates a word at a time, X must be initialized to count-2 instead. Also, this loop would only execute once on a 6502 because, as an 8-bit number, 254 is negative. With an 8-bit X register, this general loop structure will not work if X is greater than 127. With a 16-bit X register, the restriction is removed; X is positive all the way up to 32767.



X and Y can hold positively huge loop indices. Heck, any 16-bit number. The breakthrough comes when the realization hits that the index registers can contain *addresses*.

The usual 6502 way of dealing with arbitrary 16-bit pointers looks like this:

```
LDA ADDR
STA TEMP
LDA ADDR+1
STA TEMP+1
LDY #0
LDA (TEMP),Y
```

This code moves the 16-bit pointer ADDR to page zero and fetches the value it points to. Using the new indirect addressing mode and a 16-bit accumulator this can be reduced to:

```
LDA ADDR
STA TEMP
LDA (TEMP)
```

which is much nicer. But the ability to have 16-bit index registers opens up an amazing new possibility:

```
LDX ADDR
LDA 0,X
```

This looks like a typo or a new addressing mode, but it isn't. The 6502 way of thinking about indexing is that a small value (the index) is added to a larger base memory address. This makes sense, because the base address can be 16-bits while the index is only 8. With a 16-bit index register, both the base and index are equals. X can be set to 2 and LDA SCREEN,X used—or X can be set to SCREEN and LDA 2,X used. The index and the base are interchangeable.

In the last two-line sample this is taken to the extreme. The entire address is in X and it is used as an index from the very beginning of memory, address zero. It almost looks like it should be its own addressing mode—maybe LDA (X)?—but it is simply a way of using normal 6502 capabilities extended to 16-bits. This shortcut is so handy, in fact, that I have written substantial amounts of code without ever resorting to the indirect indexed or new indirect modes. As a bonus, it is also faster, because it doesn't have to do an additional read to get the pointer value. LDA (TEMP) clocks in at six cycles and LDA 0,X at only five, plus you don't have to store the pointer into page zero.



Let's take a closer look at the block move instructions, MVN and MVP, introduced last month. How quickly can MVN (the more common of the two) shuffle a block of 32 bytes from one place to another? MVN takes seven cycles per byte, so it takes 224 cycles to move our block of 32 bytes. There's

a bit of overhead too, to load A, X, and Y with the proper parameters. At three cycles per load, the total is now up to $32 \times 7 + 9$ or 233.

Without MVN, the fastest way to move a block is with straight inline loads and stores. Assuming an 8-bit accumulator and data that's not in page zero, this scheme comes in at eight ticks per byte, one short of the MVN ideal. This scheme

takes 256 cycles overall (remember, there is no set-up overhead).

Did that "8-bit accumulator" phrase catch your eye? Why not 16-bit? I set it to 8-bits in this example because that's how the block move instructions work, a byte at a time. But there's no reason we can't move 16-bits at a time. Moving our 32 bytes as 16 words takes ten cycles per word, or 160 cycles total! That's

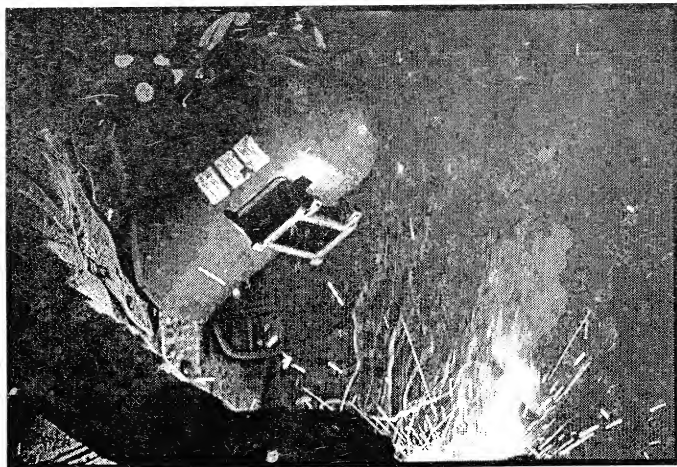
45 percent faster than MVN!

Of course, this is a mildly screwy example. The number of bytes to move is fixed — and small. And inline code is lots bigger than a tiny MVN subroutine. But it goes to show

that you shouldn't always take things at face value. That bit of extra speed comes in handy every so often, too.



I haven't rambled on about stack addressing or fun and odd ways of fooling around with a bunch of other instructions. Probably lots of other stuff too. (I would like to squeeze in a note of thanks to John Harris for setting me straight on some 24-bit addressing issues. I had been picking-up misconceptions from an 8-bit assembler that was crudely modified to generate 16-bit code.) Hopefully, even with these omissions, I have been able to jump start 6502 aficionados wanting to dive into the 65816. To your keyboards!



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North American User Groups

- | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alamo Area Atari User Association
AAAUA
Russell Stowe, President
P.O. Box 79-1426
San Antonio, TX, 78279-1426
8-Bit | Huntsville Atari Users Group
HAUG
3911 West Crestview
Huntsville, AL, 35816
? | Ol' Hackers Atari User Group
O'H AUG
3376 Ocean Harbor Drive
Oceanside, NY, 11572
8-Bit |
| Atari Bay Area Computer Users Society
ABACUS
Roger Sinasohn, President
P.O. Box 22212
San Francisco, CA, 94122
8-Bit, ST, IBM | Indiana-Michigan Atari Group Exchange
IMAGE
P.O. Box 1742
South Bend, IN, 46634-1742
8-Bit, ST | Pinellas Atari Computer Enthusiasts
PACE
Jean Brokaw, Editor
958 Phyllis Avenue
Largo, FL, 34641
8-Bit |
| Atari Exchange of Louisville
AEL
Jan Wilt, President
P.O. Box 34183
Louisville, KY, 40232
8-Bit, ST | Jersey Atari Computer Society (?)
JACS
818 Drexel Street
Delran, NJ, 08075
? | S.P.A.C.E.
P.O. Box 120016
New Brighton, MN, 55112
8-Bit |
| Diablo Valley Atari Computer Enthusiasts
DACE
Daniel Galant, President
2834 Rockridge Drive
Pleasant Hill, CA, 94523
8-Bit, ST | Jersey Atari Computer Group
JACG
Joseph Hicswa, President
23 Passaic Avenue, Apt C3
Passaic, NJ 07055
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S.D.A.C.E.
Paul Blagay, President
P.O. Box 900076
San Diego, CA, 92190
8-Bit, ST |
| Front Range Atari Users' Group
FRAUG
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3012 Rockborough Court
Fort Collins, CO, 80525
8-Bit, ST | L.C.A.C.E.
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Waukegan, IL, 60079-8788
8-Bit, ST | San Leandro Computer Club
SLCC
Robbie Bridges, President
P.O. Box 1506
San Leandro, CA, 94577-0374
8-Bit, ST, IBM |
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Victoria, B.C., V85 4G2
8-Bit, ST | Miami Valley Atari Computer Enthusiasts
M.V.A.C.E.
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Tacoma, WA, 98411-0042
8-Bit, ST |
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HACE
Bill Anderson, President
P.O. Box 820335
Houston, TX, 77282-0335
8-Bit, ST | Noah 8
3632 W. 130th Street
Cleveland, OH, 44111
8-Bit, ST | Toronto Atari Federation
TAF
5334 Yonge Street, Suite 1527
Willowdale, ONT, M2N 6M2
? |
| | North West Phoenix Atari Connection
N.W.P.A.C.
Dale Wooster, President
P.O. Box 67511
Phoenix, AZ, 85082
8-Bit | |

Australian User Groups

- | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Atari Computer Enthusiasts New South Wales
A.C.E. (N.S.W.)
Swavek Jabrzemski, President
G.P.O. Box 4514
Sydney, NSW, 2001
? | Canberra Atari Users Group
Lindsay George, Convenor
P.O. Box 29
Lyons, A.C.T., 2606
? | Queensland Atari Computer Enthusiasts
Peter Peterson, President
P.O. Box 10026
Brisbane, QLD, 4000
? |
| Adelaide Atari Computer Club
Neil Patterson, President
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8-Bit, ST | Geelong Atari Users Group
Vic Fuller, President
P.O. Box 673
Geelong, VIC
? | W.A. Atari Computer Club
Paul Blackmore, President
19 Wandarrrie Avenue
Yokine, W.A., 6060
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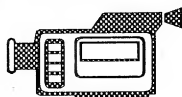
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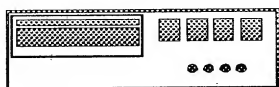
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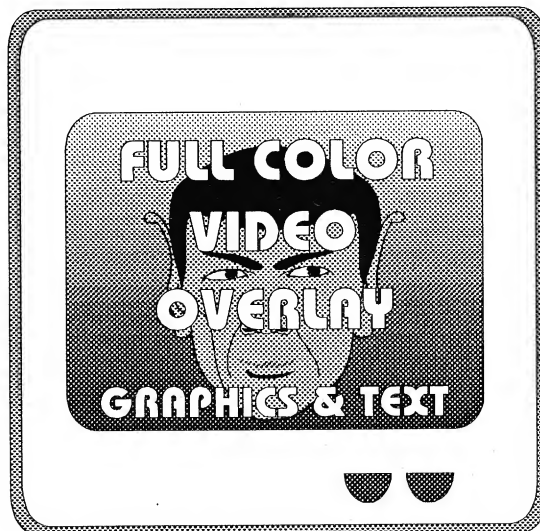
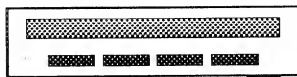
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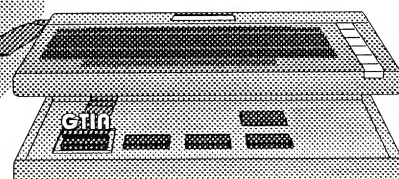
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